

APPENDIX C-2

SUPPLEMENT TO CHEMGOLD, INC. IMPERIAL PROJECT
WASTE CHARACTERIZATION STUDY

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CHEMGOLD, INC. IMPERIAL PROJECT
IMPERIAL COUNTY, CALIFORNIA

SUPPLEMENTAL WASTE CHARACTERIZATION STUDY

EMA Report No. 1093-01
September 1996

Prepared for:

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CHEMGOLD, INC. IMPERIAL PROJECT
IMPERIAL COUNTY, CALIFORNIA

SUPPLEMENTAL WASTE CHARACTERIZATION STUDY

EMA Report No. 1093-02
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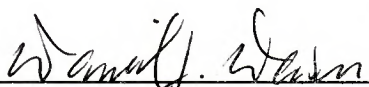
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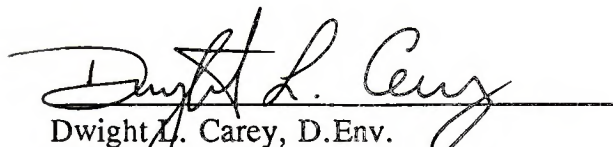
LIMITATIONS

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**CHEMGOLD, INC. IMPERIAL PROJECT
IMPERIAL COUNTY, CALIFORNIA**

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**CHEMGOLD, INC. IMPERIAL PROJECT
IMPERIAL COUNTY, CALIFORNIA**

SUPPLEMENTAL WASTE CHARACTERIZATION STUDY

1. INTRODUCTION

Chemgold, Inc. (Chemgold) has proposed the development of a conventional open-pit, heap leach, precious metal mine, the Imperial Project (Project), to be located in eastern Imperial County, California, approximately 45 miles northeast of El Centro, California and 20 miles northwest of Yuma, Arizona. A joint Draft Environmental Impact Statement and Environmental Impact Report (EIS/EIR) is being prepared by the Bureau of Land Management (BLM) office in El Centro, California and the Imperial County Planning/Building Department.

In support of this EIS/EIR, Environmental Management Associates, Inc. (EMA) prepared, in December 1995, a report entitled "Chemgold, Inc., Imperial Project, Imperial County, Waste Characterization Study" (Waste Characterization). After publication of the Waste Characterization, questions were raised regarding the possible effects of Chemgold's proposed backfilling following the completion of mining of one (1) or more of the Project pits with the waste rock (overburden and interburden material) produced during active mining. This report supplements the Waste Characterization and presents the results of geochemical analyses of sampled potential waste rock and geochemical modeling that address the potential impacts to ground water quality in the area due to the planned backfilling of the pits with waste rock.

2. OBJECTIVE

EMA was requested to conduct a geochemical investigation to provide supporting documentation in analyzing potential impacts to ground water resources from the proposed backfilling of either or both the West Pit and/or the East Pit with waste rock material. Potential impacts to ground water resources could result from:

- Acid generation from the waste rock materials and consequent mobilization of dissolved constituents; and
- Mobilization of dissolved constituents due to the interaction of the backfilled waste rock and inflowing ground water.

The objective of the geochemical investigation is to provide representative information to:

- Evaluate the potential for acid generation from the waste rock backfill materials;

- Evaluate the potential for the mobilization of dissolved constituents from the backfilled waste rock materials in the pits when the pit(s) become saturated with inflowing ground water; and
- Evaluate the potential for impacts to ground water quality at the Project mine and process area and downgradient from the Project mine and process resulting from the interactions of the backfilled waste rock materials and the inflowing ground water.

3. LITHOLOGIES AND SAMPLING METHODS

A total of nine (9) samples, representing the four (4) lithologies of the waste rock material which may be backfilled into either the West Pit or the East Pit, were collected for geochemical analysis.

The four (4) Project waste rock lithologic types are:

- (1) Biotite gneiss;
- (2) Sericite gneiss;
- (3) Volcanics;
- (4) Gravels.

The biotite gneiss is generally dark brown and oxidized. It is primarily composed of quartz, plagioclase, biotite, and potassium feldspar, with abundant secondary calcite and minor muscovite and chlorite as alteration products. Oxidation products include hematite, goethite, jarosite, and manganese oxides.

The sericite gneiss is a light brown, strongly oxidized rock. It is composed of quartz, plagioclase, sericite, potassium feldspar, muscovite, and minor calcite. Hydrous iron oxides occur as oxidation products.

The volcanics are of basaltic composition, and the Project waste rock gravels are of fanglomeratic origin.

The samples were collected from reverse circulation (RC) drill hole cuttings composited from discrete depth intervals from exploration drill holes drilled in the areas of the West Pit and East Pit. Sample locations are shown on Figure 1, and sample rock type information are shown in Table 1.

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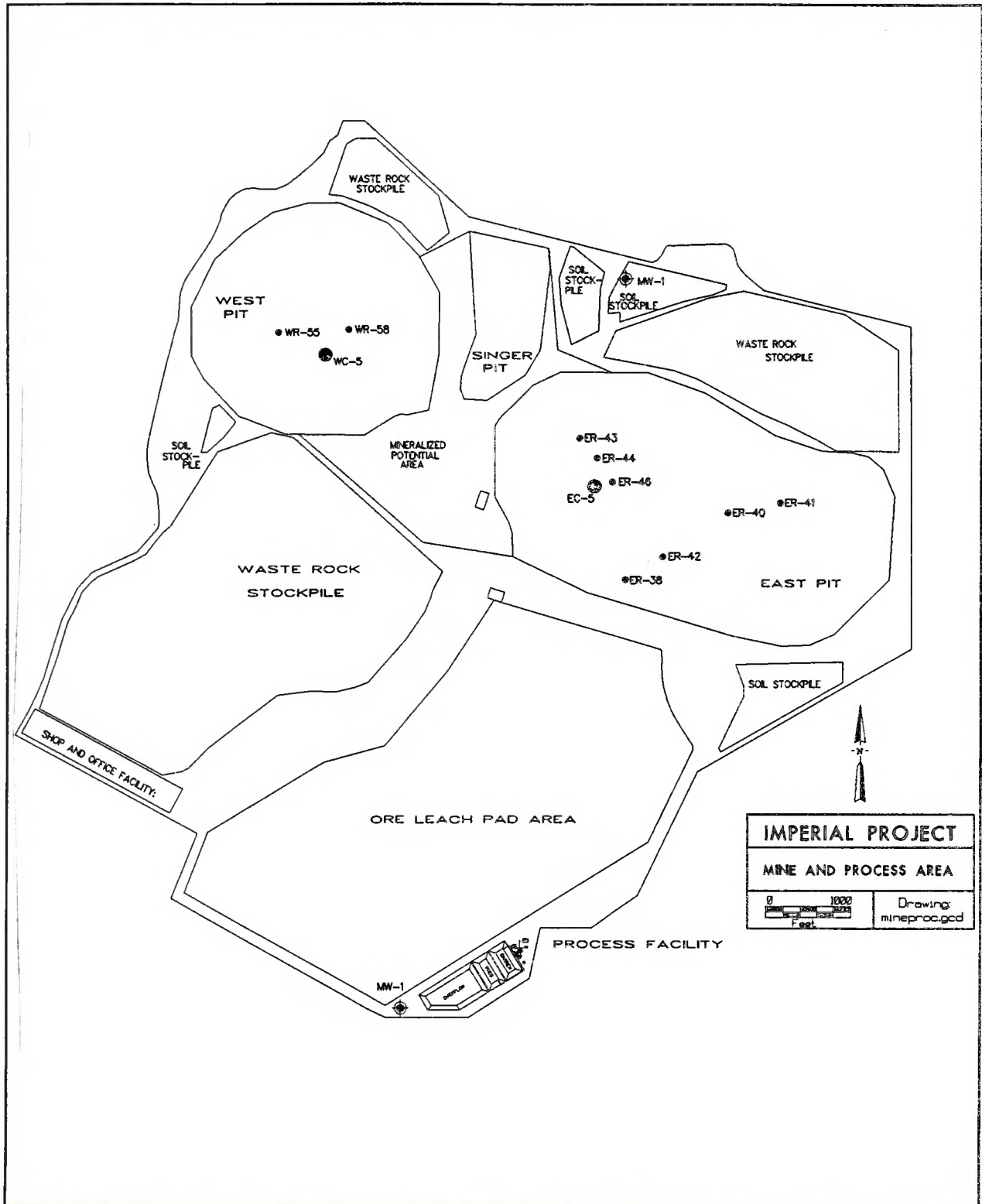


Figure 1: Hole Locations for Imperial Project Waste Rock Samples

Each sample interval was composited using a "Jones" splitter set to a 50:50 split. The initial fifty percent split was collected and mixed. The sample splitting continued until a composite of approximately 40 pounds per sample was collected for analysis by geochemical testing procedures.

4. GEOCHEMICAL TESTING PROCEDURES AND ANALYTICAL RESULTS

The geochemical characterization of the waste rock materials utilized the following testing procedures:

- Whole rock analyses;
- Static acid/base accounting methods;
- U.S. Environmental Protection Agency (USEPA) Method 1312 (synthetic precipitation leach test, single extraction); and
- USEPA Method 1320 (synthetic precipitation leach test, multiple extraction).

The testing procedures and the analytical results are presented in the following sections.

4.1. Whole Rock Analyses

The whole rock analyses were conducted to characterize the mine materials for the following major and trace elements:

silica	aluminum
iron	magnesium
calcium	sodium
potassium	titanium
phosphorus	manganese
chromium	barium
nickel	strontium
zirconium	yttrium
niobium	scandium

Whole rock analyses were conducted on each of the nine (9) composite samples using an ICP method. The whole rock analyses were used to corroborate the rock type determinations and to evaluate, in a general manner, the components that may be available for mobilization.

4.2. Static Test Methods

Static tests were conducted on each of the nine (9) samples. The static test is an acid-base accounting procedure used as a screening technique for determining whether sample material has the potential to generate or consume acid. These tests assess the potential for sample material, based on sulfur analyses, to generate acid or consume acid by estimating the balance between the acid-generating and the acid-neutralizing capacity of the sample material. Separate tests are used to determine the acid generation potential and acid neutralization potential of the sample material.

The acid-generating potential (AP) of the sample material involves determining the total amount of sulfur and sulfur species present. The sulfur species are the various oxidation states that sulfur may exist as in the rock. The two (2) most important sulfur species are sulfide sulfur (S^{2-}), the reduced form of sulfur present in pyrite and other sulfide minerals, and sulfate sulfur (SO_4^{2-}), the oxidized form of sulfur produced, in part, from the oxidation of sulfide minerals. The total sulfur is a determination of the total concentration of all sulfur, both oxidized and reduced, in the sample material. This value can be conservatively used to evaluate the acid-generating potential of the sample material by assuming all forms of sulfur are acid-generating. Pyritic sulfur (S^{2-}) is a more realistic estimation of the quantity of sulfur material that is likely to form acid upon oxidation. Sulfate sulfur (SO_4^{2-}) represents sulfur in its most oxidized form, some of which may be derived from oxidized sulfide material.

The acid neutralization potential (NP) is determined by treating the sample material with a known excess of standardized hydrochloric acid. The sample material and acid are heated to ensure that all reactions between the acid and any neutralizing components present in the sample material go to completion. The acid neutralization potential is then measured by quantifying the amount of unconsumed acid by titrating with standardized sodium hydroxide.

Both the acid generation potential and the neutralization potential are expressed as tons of calcium carbonate ($CaCO_3$) per thousand tons of material. This value represents the amount of calcium carbonate that would be needed to neutralize 1,000 tons of material. The *net* acid generation potential of the material is determined by subtracting the acid generation potential from the acid neutralization potential, the result of which may be reported as either positive or negative. A negative result indicates a sample which can be expected to generate net acidity at some point in time. Alternatively, a positive result indicates a sample which will not be a net acid generator. Samples may be considered *potentially* acid-generating when the ratio of the neutralization potential to the acid generation potential is less than 1.20, i.e., $NP:AP < 1.20$, even when the sample is determined to be strictly acid-neutralizing based on the difference between the acid neutralization and acid generation potentials. This is equivalent to a 20 percent excess

neutralization potential. This approach to the interpretation of static test results is advantageous since ratios are used instead of absolute values of the net neutralization potential, thus providing a constant factor of safety.

4.3. USEPA Method 1312 - Synthetic Precipitation Leach Test

The synthetic precipitation leach test (USEPA Method 1312) was conducted on one (1) sericite gneiss sample, one (1) gravel sample, and one (1) biotite gneiss sample. The purpose of USEPA Method 1312 is to simulate conditions under which precipitation might leach out constituents present in the sample material. Method 1312 is used by the USEPA and other federal agencies to determine the mobility of constituents present in soils and mine materials. In the USEPA Method 1312 analysis, a sample is saturated with deionized water buffered to pH 5.00 with a sulfuric acid/nitric acid mixture and bottle-rolled for 18 hours. After 18 hours, the resulting lixiviant is filtered and analyzed for dissolved constituents. The results of the lixiviant analyses are compared to appropriate water quality or other standards to determine what constituents in the sample material have the potential to mobilize and impact ground water and surface water.

4.4. USEPA Method 1320 - Multiple Extraction Procedure

The multiple extraction procedure (USEPA Method 1320) was conducted on one (1) biotite gneiss sample, two (2) sericite gneiss samples, one (1) volcanic sample, and two (2) gravel samples. The purpose of the USEPA Method 1320 analysis is to simulate leaching that a sample will undergo from repetitive precipitation events via a set of ten (10) sequential extractions. The initial extraction uses USEPA Method 1310, a toxicity extraction method. The sample is saturated with deionized water buffered with acetic acid to a pH of 5.00 and bottle-rolled for 24 hours. The leachate is filtered and analyzed for dissolved constituents. Extractions 2 through 10 are leached using a solution of distilled water buffered with a sulfuric acid/nitric acid mixture to a pH of 3.00 and each bottle-rolled for 24 hours. The leachate from each extraction is filtered and analyzed for dissolved constituents. The results of the leachate analyses are compared to appropriate water quality standards to determine the potential for impacts to water resources.

5. ANALYTICAL RESULTS

Laboratory data sheets for all of the analyses summarized in Table 2 through Table 5 are included as Appendix A.

5.1. Whole Rock Analytical Results

The results of the whole rock analyses are shown in Table 2. The sericite gneiss, biotite gneiss, and gravel samples have similar whole rock compositions, indicating that the gravel is composed primarily of gneissic material. The volcanic sample is lower in silica and higher in calcium and magnesium than the gneiss and gravel samples. This is expected in a rock of basaltic composition.

5.2. Static Test Results

The results of static test acid-base accounting analyses are shown in Table 3. The results show that one (1) of the nine (9) samples, the volcanic lithology, has some potential to generate acid. The pyritic acid-generating potential for the volcanic sample is a low 0.5 tons CaCO_3 per 1,000 tons of material, and the neutralizing potential is zero (0), yielding a low net neutralizing potential (NNP) of -0.5 tons CaCO_3 per 1,000 tons of material. The remaining eight (8) samples had NNP values that were greater than zero (0) and are moderately to substantially acid-neutralizing. The three (3) sericite gneiss samples had NNP values from 3.1 to 36.0 tons CaCO_3 ; the three (3) gravel samples have NNP values of 25.6 to 36.8 tons CaCO_3 per 1,000 tons of material; and the two (2) biotite gneiss samples have NNP values of 41.7 and 68.8 tons CaCO_3 per 1,000 tons of material.

5.3. USEPA Method 1312 Analytical Results

The results of USEPA Method 1312 analyses on the samples of sericite gneiss, gravel, and biotite gneiss are presented in Table 4. Constituent concentrations from ground water samples taken from the Project mine and process area are also shown for comparison (EMA, 1996).

The dissolved constituent concentrations in the leachate from the USEPA Method 1312 analyses are low, particularly when compared to the background ground water concentrations. Chloride, sulfate, sodium, and total dissolved solids (TDS) concentrations are all high in the ground water sample, which is typical of the ground water chemistry throughout the hydrologic basin (EMA, 1996). In the three (3) USEPA Method 1312 leachate samples, chloride ranges from 0.8 mg/l to 2.3 mg/l, compared to 162 mg/l in the ground water; sulfate is 24 mg/l in the gravel leachate sample and non-detect in the gneiss samples, compared to 310 mg/l in the ground water; sodium ranges from 6 mg/l to 21 mg/l, compared to 233 mg/l in the ground water; and TDS ranges from 180 mg/l to 250 mg/l, compared to 1,160 mg/l in the ground water.

The pH of the USEPA Method 1312 leachates from the sericite gneiss, gravel, and biotite gneiss is 7.81, 8.21, and 8.21, respectively, compared to the pH in the ground

water of 7.61. Aluminum, barium, selenium, and zinc were present at low concentrations in the USEPA Method 1312 leachate samples, but were not detected in the ground water. Relatively high concentrations of manganese in the ground water sample are typical of all the ground water samples collected from the Project mine and process area.

The selenium concentrations of 0.05 mg/l and 0.07 mg/l in the sericite gneiss and gravel leachates, respectively, reach or exceed the California primary maximum contaminant level (MCL) of 0.05 mg/l of selenium for drinking water. Iron and manganese concentrations exceeded the secondary drinking MCLs of 0.3 mg/l and 0.05 mg/l, respectively, in two (2) of the leachate samples.

5.4. USEPA Method 1320 Analytical Results

The results of USEPA Method 1320 analyses on six (6) waste rock samples are provided in Table 5. The analytical results for extractions 1 through 10 are presented for each sample.

The dissolved constituent concentrations in the initial extraction leachate for each sample are greater than all subsequent extraction leachates. Sample E-5 (sericite gneiss) has the lowest concentrations of dissolved constituents in the first extraction leachate. Alkalinity is below the detection limit of 5 mg/l, calcium is 65.7 mg/l, manganese is 0.41 mg/l, and TDS is 430 mg/l. For the remaining five (5) samples, alkalinity ranges from 540 mg/l to 1,740 mg/l; calcium from 494 mg/l to 1,370 mg/l; manganese from 1.49 mg/l to 10.4 mg/l; and TDS from 2,090 mg/l to 5,930 mg/l. The concentrations of these constituents are all much greater than the applicable concentrations in the background ground water sample, which are also presented in Table 5. In addition, aluminum concentrations in the initial USEPA Method 1320 leachates ranged from 0.11 mg/l to 0.67 mg/l, compared to less than 0.02 mg/l in the ground water sample. Iron was below the detection limit of 0.3 mg/l in all of the initial USEPA Method 1320 extraction leachates, compared to a concentration of 0.60 mg/l in the background ground water sample. Sulfate and chloride concentrations were also generally low in the initial USEPA Method 1320 leachates, compared to the background ground water concentrations of 310 mg/l and 162 mg/l, respectively.

The concentrations of dissolved constituents in the leachates from extractions 2 through 10 were all low. Alkalinity was below the detection limit of 5 mg/l in all leachates from extractions 2 through 10. Aluminum, sulfate, calcium, and manganese were present in sample leachates from extractions 2 through 10. For most of the samples, iron was present in the later leachate extractions at concentrations above the detection limit of 0.3 mg/l.

6. GEOCHEMICAL MODELING

To test the effects of the ground water inflowing to the pits and equilibrating with the backfill material under earth surface conditions, geochemical models were run and the results evaluated relative to background ground water quality and to potential impacts to ground water quality downgradient from the pits.

The USEPA geochemical model MINTEQA2 (Allison, et al, 1991) was developed to apply fundamental principles of thermodynamics to solve geochemical equilibria using mass balance relations and an aqueous speciation-solubility-adsorption model. The computer code uses its own thermodynamic database, which may be modified as new or updated data become available.

MINTEQA2 was used to speciate the chemical forms of the dissolved constituents in the water that equilibrates with the backfill waste material and to determine the effects of precipitation on the final dissolved concentrations of these constituents. Unless otherwise noted below, carbon dioxide was input at a partial pressure of $1.0 \times 10^{-3.5}$ atmospheres, equivalent to earth surface atmospheric conditions. Other specific input parameters are described in the sections for each model run.

6.1. Equilibration of Inflowing Ground Water with Backfill Material

The ground water analysis most representative of that ground water which will flow into the pits is WC-5A, collected from the corehole in the area of the West Pit (EMA, 1996). The most reactive mineral phase present in the waste rock lithologies is calcite. Therefore, in the geochemical model, ground water with a composition equivalent to sample WC-5A is equilibrated with an infinite mass of calcite. The assumption of an infinite mass of calcite being available to equilibrate with the inflowing ground water is based on the backfill waste rock material having a high surface area available to react and on calcite being reactive in the modeled system. In addition, carbon dioxide was input with a partial pressure of $1.0 \times 10^{-3.5}$ atmospheres, equivalent to the earth surface conditions under which the system will equilibrate.

The model results of the inflowing ground water equilibrating with calcite are provided in Appendix B. These results are summarized and compared to the background ground water quality in Table 6. The final model pH is 8.48, compared to the background value of 7.61. Dissolved manganese precipitated as a manganese hydroxide. The concentrations of all other dissolved constituents remained approximately the same as the background inflowing ground water concentrations.

6.2. Equilibration of USEPA Method 1312 Leachate

Geochemical models were run using as input the results of each of the three (3) USEPA Method 1312 analyses equilibrating with an infinite mass of calcite. These models were run to simulate only the contribution of those constituents which might leach from the wallrock as the ground water flowed into the pits.

The model results of the USEPA Method 1312 leachates equilibrating with calcite under atmospheric conditions are provided in Appendix C for the sericite gneiss sample, Appendix D for the gravel sample, and Appendix E for the biotite gneiss sample. These results are summarized and compared to the background ground water quality in Table 6. The final modeled pH ranged from 8.23-8.41, and the dissolved manganese and aluminum precipitated as insoluble hydroxides. The low concentrations of arsenic and mercury present in the USEPA Method 1312 leachates precipitated as barium arsenate and a mercury hydroxide during model equilibration. All other dissolved constituents have the same concentrations as the input concentrations.

6.3. Equilibration of USEPA Method 1320 Leachate

A geochemical model was run for one (1) sample of the first extraction from the USEPA Method 1320 analyses. The results of the USEPA Method 1320 analyses indicated, based on the high calcium and alkalinity concentrations, that the leachate is over-saturated relative to calcite; therefore, the geochemical model was run using the USEPA Method 1320 results as input and assuming that calcite could precipitate during equilibration with the backfill material. This model was run to simulate the contribution of constituents which might be derived from the wallrock under more rigorous leaching conditions than the USEPA Method 1312 analyses as the ground water flowed into the pits. Only the results of the first USEPA Method 1320 extraction were modeled since extractions 2 through 10 had very low concentrations of dissolved constituents for each of the samples.

The geochemical model results of the USEPA Method 1320 leachate from the sericite gneiss is provided in Appendix F. These results are summarized and compared to the background ground water quality in Table 6. As expected, the dissolved calcium and alkalinity precipitated as calcite. Manganese and aluminum precipitated as insoluble hydroxides, and some of the copper and zinc precipitated as insoluble oxides. The concentrations of all other dissolved constituents remained the same as the input concentrations.

7. DISCUSSION

Static tests and synthetic precipitation leach procedure analyses (USEPA Method 1312 and Method 1320) were conducted on samples of waste rock that will be used as backfill material in the pits after the mining operation ceases.

The results of the static tests show an overall high net neutralization potential (NNP) for the waste rock. Although the one (1) sample of basaltic volcanics had a slight acid-generating potential of 0.5 tons CaCO_3 per 1,000 tons of material, all other samples had moderate to substantial net neutralization potentials of from 10.3 to greater than 229 tons CaCO_3 per 1,000 tons of material, due primarily to the presence of secondary calcite and the lack of sulfide mineral phases from which acid could be generated. This, combined with the volcanic's very small percentage in the total waste rock lithology, will result in the average NNP of the waste rock being high.

The results of USEPA Method 1312 analyses show low concentrations of all constituents in the sample leachates compared to background water quality. The low concentrations of manganese and iron are present due to the dissolution of secondary oxides and oxyhydroxides. Selenium was present in two (2) samples at concentrations of 0.05 mg/l and 0.07 mg/l, at or greater than the drinking water MCL of 0.05 mg/l. Selenium may be present due to desorption from metal oxides.

The results of USEPA Method 1320 analyses show high dissolved constituent concentrations only in the first extraction. Extractions 2 through 10 generally show low concentrations except during the later extractions, when high iron concentrations are produced from oxide dissolution due to the low pH and lack of remaining buffering capacity in the sample. The high calcium and alkalinity concentrations are due to the dissolution of calcite during the initial extraction and contribute to the high total dissolved solids (TDS) concentrations in each leachate. The manganese and aluminum concentrations are due to the dissolution of manganese oxides and oxyhydroxides. The alkalinity, TDS, calcium, manganese, and aluminum concentrations are initially greater than the concentrations present in the background ground water. This is due to the more rigorous leaching of the USEPA Method 1320 extraction than the natural processes with which the ground water has equilibrated.

The geochemical models showed that metal oxides and oxyhydroxides will form from the dissolved constituents in the ground water and leachate samples, similar to the manganese and iron oxides present in the waste rock lithologies. In addition, the pH will be buffered to approximately 8.4 by the calcite in the waste rock and by the atmospheric partial pressure of carbon dioxide. Thus, the geochemical models show reasonable results for a ground water equilibrating with calcite under earth surface conditions.

8. CONCLUSIONS

Analyses were conducted on samples of waste rock that may be used as backfill material in the Project pits following cessation of mining. Static tests and synthetic precipitation leach analyses (USEPA Method 1312 and Method 1320) were conducted to evaluate potential effects of the interaction of ground water flowing into the pit(s) with the backfilled waste rock material. The results of the analyses reveal the following:

- (1) There is no potential for acid conditions to form in the any of the Project pits; and
- (2) There are no characteristics of the inflowing ground water which would interact with the backfilled waste rock material in the pits and produce any substantial changes to ground water quality in the Project mine and process area or downgradient.

Geochemical models were run to evaluate the water quality after equilibration of the inflowing ground water with the backfilled waste rock material. The models were run assuming equilibration with calcite, the reactive mineral phase in the backfilled waste rock, and with a partial pressure of carbon dioxide of $1.0 \times 10^{-3.5}$ atmospheres, equivalent to earth surface atmospheric conditions. The results of the geochemical models show that the pH of the impounded water in the pits will be approximately 8.3 to 8.5, and that the dissolved constituent concentrations will be approximately equal to the existing background ground water concentrations.

The results of the laboratory analyses and the geochemical modeling show that, compared with the existing background water quality in the Project mine and process area, no substantial change to water quality at the Project mine and process area or downgradient of the mine site will occur.

9. REFERENCES

- Environmental Management Associates, 1996: *Supplemental Hydrology Study, Imperial Project, Imperial County, California*. September 1996.
- Allison, J.D., D.S. Brown, and K.J. Novo-Gradac, 1991: *MINEQA2/PRODEFA2, A Geochemical Assessment Model for Environmental Systems: Version 3.0 Users Manual*. U.S. Environmental Protection Agency Office of Research and Development; Environmental Research Laboratory, Athens, Georgia. EPA/600/3-91/021.

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Table 1: Rock Sample Types and Sample Locations

Pit	Sample	Rock Type	Sample Drill Hole	Sample Depth (ft)
East	E-1	sericite gneiss	ER-44	700-820
East	E-2	sericite gneiss	ER-46	700-870
East	E-3	gravel	ER-40/ER-41/ER-42	0-300/0-120/0-200
East	E-4	gravel	ER-38/ER-43/ER-46	0-200/0-350/0-110
East	E-5	sericite gneiss	ER-44	525-560
East	E-6	volcanic	ER-43/ER-46	410-440/525-560
West	W-1	biotite gneiss	WR-55	580-780
West	W-2	biotite gneiss	WR-58	580-760
West	W-3	gravel	WR-58	0-180

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Table 2: Results of Whole Rock Analyses

Analyte ¹	E-1	E-2	E-3	E-4	E-5	E-6	W-1	W-1 ²	W-2	W-3
	Sericite Gneiss	Sericite Gneiss	Gravel	Gravel	Sericite Gneiss	Volcanic	Biotite Gneiss	Biotite Gneiss	Biotite Gneiss	Gravel
SiO ₂	65.17	65.49	66.54	66.32	73.85	47.76	66.06	65.99	61.98	67.33
Al ₂ O ₃	14.64	14.87	13.40	13.80	13.60	14.15	13.82	13.77	14.83	13.60
Fe ₂ O ₃	5.07	4.81	4.95	4.83	1.96	6.15	3.88	3.94	5.53	4.29
MgO	0.60	0.70	1.00	1.16	0.41	3.01	0.22	0.23	0.81	1.01
CaO	2.29	1.37	3.27	3.01	0.37	10.58	3.08	3.06	3.12	3.24
Na ₂ O	2.54	3.43	2.99	2.84	1.44	2.25	3.98	3.94	2.54	2.84
K ₂ O	5.13	4.49	3.45	3.27	4.91	1.11	4.02	4.24	4.80	4.76
TiO ₂	0.58	0.55	0.51	0.50	0.38	0.89	0.44	0.46	0.69	0.44
P ₂ O ₅	0.08	0.17	0.10	0.11	0.03	0.19	0.09	0.12	0.26	0.09
MnO	0.11	0.12	0.09	0.08	0.03	0.12	0.08	0.08	0.13	0.06
Cr ₂ O ₃	0.003	0.002	0.005	<0.001	0.003	0.016	0.001	0.003	0.003	0.003
Ba	736	955	1,172	1,095	516	1,020	756	756	974	1,415
Ni	<20	<20	22	<20	<20	39	<20	<20	<20	<20
Sr	218	221	257	278	97	553	104	105	190	294
Zr	173	163	145	198	175	139	117	107	136	144
Y	25	19	17	17	26	16	19	18	21	14
Nb	16	14	11	11	22	15	14	14	16	12
Sc	<10	<10	<10	<10	<10	10	<10	<10	<10	<10
LOI ³	3.7	3.1	3.0	3.2	2.0	13.3	3.3	3.3	4.4	2.6
SUM	100.01	99.32	99.56	99.39	99.11	99.79	99.13	99.30	99.31	100.56

¹Units: oxides in percent, metals in ppm

²Rerun sample

³Loss on Ignition

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Table 3: Static Test Results

Sample Number	Sample Rock Type	Sulfur Species (%)			ANP	AGP (pyritic)	NNP	ANP:AGP
		Total	Sulfate	Pyritic	tons CaCO ₃ /kT			
E-1	sericite gneiss	<0.01	<0.01	0.01	36.4	0.4	36.0	91.0
E-2	sericite gneiss	0.02	<0.01	<0.01	20.5	<0.3	20.5	>68.4
E-3	gravel	<0.01	<0.01	0.01	37.2	0.4	36.8	93.0
E-4	gravel	<0.01	<0.01	0.02	26.2	0.6	25.6	43.7
E-5	sericite gneiss	<0.01	<0.01	<0.01	3.1	<0.3	3.1	>10.3
E-6	volcanic	<0.01	<0.01	0.02	<0.1	0.5	-0.5	<0.2
W-1	biotite gneiss	<0.01	<0.01	<0.01	68.8	<0.3	68.8	>229
W-2	biotite gneiss	<0.01	<0.01	0.01	42.1	0.4	41.7	105
W-3	gravel	0.05	<0.01	0.01	31.0	0.4	30.6	77.5

ANP: acid-neutralizing potential
AGP: acid-generating potential
NNP: net-neutralizing potential

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Table 4: EPA Method 1312 Results

Analytes (mg/l)	Ground Water Quality (Sample WC-5A [EMA, 1996]) (mg/l)	Sample		
		E-2 sericite gneiss	E-4 gravel	W-2 biotite gneiss
Alkalinity (as CaCO ₃)	210	38	40	34
Chloride	162	1.8	2.3	0.8
Fluoride	0.8	0.2	0.2	0.1
Nitrate/Nitrite (as N)	0.06	<0.05	<0.05	<0.05
Phosphorus	0.03	0.02	0.07	0.05
Sulfate	310	<10	24	<10
pH	7.61	7.81	8.21	8.21
Aluminum	<0.02	0.34	0.11	0.32
Antimony	<0.005	<0.005	<0.005	<0.005
Arsenic	<0.01	<0.01	0.01	0.02
Barium	0.03	0.38	0.24	0.21
Beryllium	0.001	0.001	<0.001	<0.001
Bismuth	<1	<1	<1	<1
Boron	0.74	0.25	0.20	0.13
Cadmium	<0.005	<0.005	<0.005	<0.005
Calcium	59.4	13.8	27.0	11.8
Chromium	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.03	<0.03	<0.03	<0.03
Copper	<0.01	<0.01	<0.01	<0.01
Gallium	<0.5	<0.5	<0.5	<0.5
Iron	0.60	0.10	<0.03	0.15
Lead	<0.003	<0.003	0.017	0.005
Lithium	0.07	<0.01	<0.01	<0.01
Magnesium	16.1	0.6	0.7	0.8
Manganese	0.47	0.13	0.09	0.04
Mercury	<0.0002	<0.0002	<0.0002	0.0004
Molybdenum	<0.05	<0.05	<0.05	<0.05
Nickel	<0.04	<0.04	<0.04	<0.04
Potassium	12	<5	<5	<5
Scandium	<0.01	<0.01	<0.01	<0.01
Selenium	<0.01	0.05	0.07	<0.01
Silver	<0.01	<0.01	<0.01	<0.01
Sodium	233	8	21	6
Strontium	1.30	0.21	0.09	0.35
Thallium	<0.002	<0.002	<0.002	<0.002
Tin	<0.05	<0.05	<0.05	<0.05
Titanium	<0.01	<0.01	<0.01	<0.01
Vanadium	<0.05	<0.05	<0.05	<0.05
Zinc	<0.01	0.35	0.21	0.19
Total Dissolved Solids	1,160	180	220	250

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Table 5: EPA Method 1320 Results

SAMPLE E-1 (SERICITE GNEISS)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Alkalinity (as CaCO ₃)	1,040	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloride	3.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoride	0.1	0.3	0.5	0.6	0.6	0.5	0.3	0.2	0.1	<0.1
Nitrate/Nitrite (as N)	1.90	5.6	3.22	3.47	8.9	20.4	2.59	3.44	6.5	2.75
Phosphorus	<0.01	0.36	2.9	0.08	2.53	2.35	0.98	0.40	0.13	<0.01
Sulfate	12	29	28	20	20	20	20	20	20	20
pH	5.45	4.36	4.26	3.90	3.40	1.82	3.66	2.71	3.33	3.59
Aluminum	0.11	0.22	0.51	0.51	0.57	0.46	0.26	0.27	0.25	0.25
Antimony	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium	689	19.5	14.5	11.0	10.4	10.3	6.0	5.9	5.0	4.9
Chromium	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Copper	0.13	0.03	0.05	0.05	0.05	0.07	0.05	0.06	0.06	0.08
Gallium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Lead	0.004	0.008	<0.003	<0.003	0.005	<0.003	<0.003	<0.003	0.003	0.004

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SAMPLE E-1 (SERICITE GNEISS)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Lithium	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	4.9	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4
Manganese	7.37	0.54	0.63	0.62	0.68	0.80	0.65	0.96	1.14	2.63
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium	22	<5	<5	<5	<5	<5	<5	<5	<5	<5
Scandium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	0.01	<0.01	0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	10	1	<1	1	1	<1	<1	<1	1	1
Strontium	1.50	0.06	0.05	0.04	0.04	0.04	0.02	0.03	0.04	0.06
Thallium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06
Titanium	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TDS	3,050	110	60	40	50	20	40	40	30	30



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SAMPLE E-3 (GRAVEL)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Alkalinity (as CaCO ₃)	540	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloride	4.2	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoride	0.3	0.6	0.5	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1
Nitrate/Nitrite (as N)	2.96	63.5	2.98	5.5	8.2	3.60	2.33	3.12	12.6	2.31
Phosphorus	0.04	0.66	0.04	0.06	0.10	<0.01	<0.01	<0.01	<0.01	<0.01
Sulfate	22	35	25	18	19	20	20	20	20	20
pH	4.99	1.92	4.44	3.72	3.67	2.65	5.05	4.88	2.20	3.26
Aluminum	0.41	0.37	0.48	0.35	0.18	<0.05	<0.05	0.08	0.06	<0.05
Antimony	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium	494	17.3	11.6	6.6	4.5	2.5	1.7	1.3	1.4	0.7
Chromium	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Copper	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Gallium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron	<0.3	<0.3	4.0	8.6	13.6	13.6	14.0	13.7	20.1	15.3
Lead	<0.003	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Lithium	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	4.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.2
Manganese	2.01	0.58	0.63	0.51	0.50	0.41	0.44	0.50	0.49	0.34

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SAMPLE E-3 (GRAVEL)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium	18	<5	<5	<5	<5	<5	<5	<5	<5	<5
Scandium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	18	1	<1	2	1	<1	<1	1	<1	<1
Strontium	0.69	0.04	0.03	0.03	0.02	0.01	0.01	0.01	0.01	<0.01
Thallium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TDS	2,090	100	60	50	60	70	50	50	50	60

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SAMPLE E-5 (SERICITE GNEISS)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Alkalinity (as CaCO ₃)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloride	2.0	<0.5	<0.5	0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5
Fluoride	0.2	0.3	0.4	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1
Nitrate/Nitrite (as N)	3.52	7.10	3.05	4.20	4.43	7.4	2.43	2.47	2.76	2.40
Phosphorus	0.21	2.29	0.57	0.38	0.23	0.04	0.02	<0.01	<0.01	<0.01
Sulfate	16	26	24	20	20	20	20	20	20	20
pH	2.86	3.53	3.66	3.42	3.36	2.34	3.68	4.07	3.34	4.63
Aluminum	0.30	0.44	0.37	0.29	0.62	0.12	0.10	0.12	0.06	0.06
Antimony	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium	65.7	13.5	9.6	5.0	3.3	2.9	1.7	1.5	0.6	0.6
Chromium	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Copper	0.03	0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Gallium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron	<0.3	<0.3	<0.3	0.5	1.4	4.1	8.5	12.5	14.5	16.3
Lead	<0.003	0.005	0.005	0.009	<0.003	0.007	0.005	<0.003	<0.003	<0.003
Lithium	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	2.3	0.5	0.3	0.3	0.1	0.1	<0.1	0.2	<0.1	<0.1
Manganese	0.41	0.13	0.11	0.09	0.09	0.11	0.12	0.14	0.11	0.12

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SAMPLE E-5 (SERICITE GNEISS)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium	8	<5	<5	<5	<5	<5	<5	<5	<5	<5
Scandium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	5	1	<1	2	<1	<1	<1	1	<1	<1
Strontium	0.69	0.13	0.08	0.04	0.03	0.03	0.02	0.02	<0.01	<0.01
Thallium	0.022	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TDS	430	60	50	30	30	70	40	50	60	60



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SAMPLE E-6 (VOLCANIC)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Alkalinity (as CaCO ₃)	1,740	20	20	<5	<5	<5	<5	<5	<5	<5
Chloride	6.0	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoride	<0.1	0.1	0.3	0.4	0.4	0.4	0.2	0.2	0.1	0.2
Nitrate/Nitrite (as N)	7.4	6.3	2.91	3.46	3.86	3.66	2.62	3.42	10.8	3.30
Phosphorus	0.35	0.48	0.29	1.8	1.86	1.04	0.50	0.29	0.22	0.06
Sulfate	59	28	25	24	26	20	20	20	20	20
pH	5.12	5.16	5.12	3.97	3.82	2.87	4.95	4.64	4.38	2.71
Aluminum	0.32	0.08	0.11	0.30	0.34	0.28	0.23	0.17	0.20	0.09
Antimony	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium	1,370	33.0	17.7	15.9	14.8	13.4	11.7	13.3	14.5	10.7
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Gallium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.4	1.0	2.0	2.5
Lead	<0.003	<0.003	0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Lithium	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	11.7	0.5	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.4
Manganese	3.28	0.13	0.10	0.13	0.23	0.37	0.42	0.55	0.50	0.40

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SAMPLE E-6 (VOLCANIC)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium	41	<5	<5	<5	<5	<5	<5	<5	<5	<5
Scandium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	49	3	<1	2	1	<1	1	1	1	<1
Strontium	5.18	0.17	0.07	0.07	0.07	0.06	0.05	0.06	0.07	0.05
Thallium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TDS	5,930	180	70	90	80	80	40	70	80	60



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SAMPLE W-1 (BIOTITE GNEISS)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Alkalinity (as CaCO ₃)	1,120	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloride	3.4	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoride	<0.1	<0.1	0.8	0.7	0.6	0.7	0.4	0.2	<0.1	<0.1
Nitrate/Nitrite (as N)	1.50	6.10	2.92	4.71	9.7	5.4	2.49	3.10	3.18	3.66
Phosphorus	0.04	0.03	0.03	2.7	2.86	2.50	1.38	0.29	0.03	<0.01
Sulfate	47	27	28	22	21	20	20	20	20	20
pH	5.05	4.19	4.15	3.60	3.29	2.33	3.64	3.42	3.40	2.95
Aluminum	0.41	0.17	0.90	0.75	0.74	0.63	0.50	0.47	0.65	0.75
Antimony	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium	1,080	17.9	14.9	10.7	9.1	8.3	6.2	4.4	2.0	1.3
Chromium	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Copper	0.05	<0.01	<0.01	<0.01	<0.01	0.02	0.01	0.02	<0.01	0.01
Gallium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.9
Lead	<0.003	0.003	0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Lithium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	2.8	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	<0.1
Manganese	10.4	0.75	0.62	0.60	0.54	0.55	0.71	0.96	0.92	1.37

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SAMPLE W-1 (BIOTITE GNEISS)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium	17	<5	<5	<5	<5	<5	<5	<5	<5	<5
Scandium	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	4	2	<1	1	1	<1	1	1	1	<1
Strontium	0.70	0.04	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02
Thallium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002
Tin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TDS	4,470	130	60	50	50	80	20	30	20	

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SAMPLE W-3 (GRAVEL)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Alkalinity (as CaCO ₃)	1,140	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloride	9.3	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5
Fluoride	1.0	0.9	0.9	0.4	0.2	0.2	<0.1	<0.1	<0.1	<0.1
Nitrate/Nitrite (as N)	3.98	6.1	3.06	2.98	5.1	5.9	2.30	2.94	2.98	2.41
Phosphorus	0.10	1.21	0.24	0.66	0.24	0.03	<0.01	<0.01	<0.01	<0.01
Sulfate	260	32	24	19	17	20	20	20	20	20
pH	5.36	3.90	4.28	4.17	3.27	2.29	4.89	4.80	4.62	4.88
Aluminum	0.67	0.69	0.70	0.39	0.32	0.15	0.08	0.14	0.14	0.06
Antimony	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic	0.01	0.02	0.07	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium	805	19.6	13.0	7.8	5.3	3.9	1.8	2.2	1.2	0.9
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Copper	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Gallium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron	<0.3	<0.3	1.2	4.8	8.9	14.2	14.4	15.3	13.8	7.2
Lead	<0.003	<0.003	<0.003	<0.003	0.004	<0.003	<0.003	<0.003	<0.003	<0.003
Lithium	0.02	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Magnesium	4.9	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.2
Manganese	1.49	0.37	0.43	0.36	0.30	0.30	0.27	0.35	0.23	0.11

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SAMPLE W-3 (GRAVEL)										
Analytes (mg/l)	Extraction									
	1	2	3	4	5	6	7	8	9	10
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium	17	<5	<5	<5	<5	<5	<5	<5	<5	<5
Scandium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	20	2	<1	1	1	<1	<1	2	1	<1
Strontium	1.26	0.10	0.06	0.04	0.03	0.02	0.01	0.02	0.01	<0.01
Thallium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	0.51	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc	2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TDS	3,430	100	70	50	60	80	40	50	60	50

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Table 6: Geochemical Model Results

Analyte (mg/l)	Background Groundwater (WC-5A) (mg/l)	Sample (mg/l)				
		Groundwater	1312			1320
		WC-5A	E-2	E-4	W-2	E-1
pH	7.61	8.48	8.29	8.23	8.41	8.48
Sulfate	310	310	ND	24	ND	40
Strontium	1.30	1.30	0.21	0.09	0.35	1.5
Beryllium	0.001	0.001	0.001	ND	ND	ND
Boron	0.74	0.74	0.25	0.20	0.13	ND
Chloride	162	162	1.8	2.3	0.8	3.4
Fluoride	0.8	0.002	0.002	0.002	0.003	0.100
Lithium	0.07	0.07	ND	ND	ND	ND
Magnesium	16.1	16.1	0.6	0.7	0.8	4.9
Potassium	12	12.	ND	ND	ND	22
Nitrate N	0.06	0.27	ND	ND	ND	1.9
Phosphorus	0.03	0.009	0.003	0.002	0.004	ND
Calcium	59.4	13.9	19.6	28.6	11.5	9.5
Alkalinity (CO ₃)	201	100	59.6	51.8	77.1	92.5
Iron	0.60	0.10	0.01	ND	ND	ND
Sodium	233	233	8	21	6	10
Manganese	0.47	3.1×10^{-21}	5.5×10^{-21}	9.7×10^{-21}	2.4×10^{-21}	ND
Barium	0.03	0.01	0.38	0.10	0.16	ND
Arsenic	<0.01	ND	ND	8.6×10^{-8}	2.5×10^{-8}	ND
Zinc	<0.01	ND	0.35	0.21	0.19	0.9
Lead	<0.003	ND	ND	0.017	0.005	0.004
Selenium	<0.01	ND	0.05	0.07	ND	ND
Aluminum	<0.02	ND	0.0004	0.0004	0.0006	0.0007
Mercury	<0.0002	ND	ND	ND	1.3×10^{-6}	ND
Chromium	<0.01	ND	ND	ND	ND	0.03
Copper	<0.01	ND	ND	ND	ND	0.06

ND: not detected in the input analytical data

APPENDIX A
ANALYTICAL RESULTS OF WASTE ROCK ANALYSES



CORE LABORATORIES

ANALYTICAL REPORT

JOB NUMBER: 962376

Prepared For:

Environmental Management Assoc.
100 West Grove Street
Suite 100
Reno, NV 89509-4026

Attention: Daniel Davis

Date: 09/20/96

Signature

Name: Patrick J. McEntee

Title: Laboratory Supervisor

Date

CORE LABORATORIES, INC.
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100 West Grove Street • Suite 100 • Reno, Nevada 89509-4026 • (702) 828-3939 • FAX (702) 828-3940

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS		REMARKS					
96228		CHEMGOLD									
SAMPLERS: (Signature)											
DANIEL DAVIS / DAN PURVANCE											
Sample STA. NO. ID.	DATE	TIME	DAY	STATION LOCATION							
1 E-1	8-27-96		✓	pit borehole	1 bucket	✓	✓				(1) 6 samples - 1320
2 E-2						✓	✓				(2) 3 samples - 1312
3 E-3						✓	✓				(3) 6 samples - static
4 E-4						✓	✓				(4) remove a split from each sample for later whole rock analysis
5 E-5						✓	✓				(5) send splits to:
6 E-6						✓	✓				DANIEL DAVIS, WESTEC
7 N-1						✓	✓				5250 Neil Rd, Ste 300
8 W-2						✓	✓				Reno, NV 89502
9 W-3	✓		✓	↓	✓	✓	✓				(702) 828-6800 phone
											(702) 828-6820 FAX
Relinquished by: (Signature)				Date / Time	Received by: (Signature)		Relinquished by: (Signature)		Date / Time	Received by: (Signature)	
[Signature]				8-27-96							
Relinquished by: (Signature)				Date / Time	Received by: (Signature)		Relinquished by: (Signature)		Date / Time	Received by: (Signature)	
Relinquished by: (Signature)				Date / Time	Received for Laboratory by: (Signature)		Date / Time		Remarks		

Distribution: Original Accompanies Shipments; Copy to Coordinator Field Files



Sample Delivery Group Narrative

September 18, 1996

Customer: Environmental Management Associates

Project: CHEMGOLD 96228

Core Laboratories Project Number: 962376

During the analysis and subsequent data review, it was noted that the recoveries for the spike blanks for GFAA antimony and thallium were outside of the normal acceptance limits for laboratory control samples for job 962376 (1312 extractions). When the samples were analyzed, it was found that all method spikes recoveries were acceptable per the analytical methods. Upon further questioning of the analyst that prepared the samples, it was found that the spike blanks were accidentally not spiked. Because the method spike recoveries were acceptable for the analytes of interest and all other quality control samples were acceptable, this data was accepted and reported. Under a normal CLP reporting format, the affected values would be flagged with a "^" on the final report.

It was also noted that the extraction duplicates for sample 962376-004 (E-4) for calcium, magnesium, manganese, strontium and zinc were outside of the normal acceptance limits for method duplicates. Upon review of the data, no definitive answer was found to explain the variance although a nonhomogeneous sample matrix is suspected to be a contributing factor. Under a normal CLP reporting format, these values and all associated values would be flagged with an "*" on the final report.

Linda L. Benkers
QA/QC Coordinator

Timothy L. Kellogg
Laboratory Supervisor



CORE LABORATORIES

SAMPLE INFORMATION

Date: 09/20/96

Job Number.: 962376
Customer ...: Environmental Management Assoc.
Attn.....: Daniel Davis

Project Number.....: 96000178
Customer Project ID....: CHEMGOLD 96228
Project Description....: Chemgold

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
962376-1	E-1	Soil	08/27/96	00:00	08/28/96	10:00
962376-2	E-2	Soil	08/27/96	00:00	08/28/96	10:00
962376-3	E-3	Soil	08/27/96	00:00	08/28/96	10:00
962376-4	E-4	Soil	08/27/96	00:00	08/28/96	10:00
962376-5	E-5	Soil	08/27/96	00:00	08/28/96	10:00
962376-6	E-6	Soil	08/27/96	00:00	08/28/96	10:00
962376-7	W-1	Soil	08/27/96	00:00	08/28/96	10:00
962376-8	W-2	Soil	08/27/96	00:00	08/28/96	10:00
962376-9	W-3	Soil	08/27/96	00:00	08/28/96	10:00
962376-10					09/09/96	11:50



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Customer Sample ID: E-1
Date Sampled.....: 08/27/96
Time Sampled.....: 00:00
Sample Matrix.....: Soil

Laboratory Sample ID: 962376-1
Date Received.....: 08/28/96
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 600 3.2.3	Acid Neutralization Potential, Solid	36.4	0.1	t CaCO ₃ /kt	09/11/96	sgm
ASTM D 2492-90	Pyritic Sulfur, Solid	0.01	0.01	%	09/05/96	pjm
ASTM D 2492-90	Pyritic Sulfur, Solid	0.4	0.3	t CaCO ₃ /kt	09/05/96	pjm
EPA 600 3.1.2-3	Sample Preparation, Solid	Complete			09/05/96	dme
ASTM D 2492-90	Sulfate Sulfur, Solid	<0.01	0.01	%	09/06/96	sgm
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.01	0.01	%	09/13/96	* sl
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.3	0.3	t CaCO ₃ /kt	09/13/96	* sl
ASTM D 2492-90	Unidentified Sulfur, Solid	<0.01	0.01	%	09/05/96	pjm



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Customer Sample ID: E-2
Date Sampled.....: 08/27/96
Time Sampled.....: 00:00
Sample Matrix.....: Soil

Laboratory Sample ID: 962376-2
Date Received.....: 08/28/96
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Extract	38	5	mg/L CaCO ₃	09/19/96	sgm
EPA 325.2	Chloride, Extract	1.8	0.5	mg/L	09/17/96	sgm
EPA 340.2	Fluoride (F), Extract	0.2	0.1	mg/L	09/12/96	dme
EPA 353.2	Nitrate + Nitrite as N, Extract	<0.05	0.05	mg/L	09/19/96	sgm
EPA 365.2	Phosphorous, Total, Extract	0.02	0.01	mg/L	09/15/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Extract	180	10	mg/L	09/12/96	sgm
EPA 375.2	Sulfate (SO ₄), Extract	<10.	10.	mg/L	09/16/96	sgm
EPA 150.1	pH, Extract	7.81	0.01	pH Units	09/19/96	sgm
SW-846 3010	Acid Digestion, Total Metals	Complete			09/11/96	g
SW-846 6010A	Aluminum (Al), Total	0.34	0.05	mg/L	09/12/96	gag
SW-846 7041	Antimony (Sb), Total	<0.005	0.005	mg/L	09/11/96	lmt
SW-846 6010A	Arsenic (As), Total	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Barium (Ba), Total	0.38	0.01	mg/L	09/12/96	gag
SW-846 6010A	Beryllium (Be), Total	0.001	0.001	mg/L	09/12/96	gag
ASTM 3111B	Bismuth (Bi), Total	<1	1	mg/L	09/12/96	lmt
SW-846 6010A	Boron (B), Total	0.25	0.05	mg/L	09/12/96	gag
SW-846 6010A	Cadmium (Cd), Total	<0.005	0.005	mg/L	09/12/96	gag
SW-846 6010A	Calcium (Ca), Total	13.8	0.1	mg/L	09/12/96	gag
SW-846 6010A	Chromium (Cr), Total	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Cobalt (Co), Total	<0.03	0.03	mg/L	09/12/96	gag
SW-846 6010A	Copper (Cu), Total	<0.01	0.01	mg/L	09/12/96	gag
ASTM 3111B	Gallium (Ga), Total	<0.5	0.5	mg/L	09/12/96	lmt
SW-846 6010A	Iron (Fe), Total	0.10	0.03	mg/L	09/12/96	gag
SW-846 6010A	Lead (Pb), Total	<0.003	0.003	mg/L	09/12/96	gag
SW-846 6010A	Lithium (Li), Total	<0.01	0.01	mg/L	09/12/96	gag



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Customer Sample ID: E-2
Date Sampled.....: 08/27/96
Time Sampled.....: 00:00
Sample Matrix.....: Soil

Laboratory Sample ID: 962376-2
Date Received.....: 08/28/96
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Magnesium (Mg), Total	0.6	0.1	mg/L	09/12/96	gag
SW-846 6010A	Manganese (Mn), Total	0.13	0.01	mg/L	09/12/96	gag
SW-846 7470	Mercury (Hg), Total	<0.0002	0.0002	mg/L	09/12/96	lmt
SW-846 6010A	Molybdenum (Mo), Total	<0.05	0.05	mg/L	09/12/96	gag
SW-846 6010A	Nickel (Ni), Total	<0.04	0.04	mg/L	09/12/96	gag
SW-846 6010A	Potassium (K), Total	<5	5	mg/L	09/12/96	gag
SW-846 6010A	Scandium (Sc), Total	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Selenium (Se), Total	0.05	0.01	mg/L	09/12/96	gag
I-846 6010A	Silver (Ag), Total	<0.01	0.01	mg/L	09/16/96	gag
SW-846 6010A	Sodium (Na), Total	8	1	mg/L	09/12/96	gag
SW-846 6010A	Strontium (Sr), Total	0.21	0.01	mg/L	09/12/96	gag
SW-846 7841	Thallium (Tl), Total	<0.002	0.002	mg/L	09/12/96	lmt
SW-846 6010A	Tin (Sn), Total	<0.05	0.05	mg/L	09/12/96	gag
SW-846 6010A	Titanium (Ti), Total	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Vanadium (V), Total	<0.05	0.05	mg/L	09/12/96	gag
SW-846 6010A	Zinc (Zn), Total	0.35	0.01	mg/L	09/12/96	gag
SW-846 1312	1312 Extraction, Solid	Complete			09/10/96	lmt
EPA 600 3.2.3	Acid Neutralization Potential, Solid	20.5	0.1	t CaCO3/kt	09/11/96	sgm
ASTM D 2492-90	Pyritic Sulfur, Solid	<0.01	0.01	%	09/05/96	pjm
ASTM D 2492-90	Pyritic Sulfur, Solid	<0.3	0.3	t CaCO3/kt	09/05/96	pjm
EPA 600 3.1.2-3	Sample Preparation, Solid	Complete			09/05/96	dme
ASTM D 2492-90	Sulfate Sulfur, Solid	<0.01	0.01	%	09/06/96	sgm
ASTM D4239-85C	Total Sulfur (Leco), Solid	0.02	0.01	%	09/13/96	* sl
ASTM D4239-85C	Total Sulfur (Leco), Solid	0.7	0.3	t CaCO3/kt	09/13/96	* sl
ASTM D 2492-90	Unidentified Sulfur, Solid	0.02	0.01	%	09/05/96	pjm



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Customer Sample ID: E-3
Date Sampled.....: 08/27/96
Time Sampled.....: 00:00
Sample Matrix.....: Soil

Laboratory Sample ID: 962376-3
Date Received.....: 08/28/96
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 600 3.2.3	Acid Neutralization Potential, Solid	37.2	0.1	t CaCO ₃ /kt	09/11/96	sgm
ASTM D 2492-90	Pyritic Sulfur, Solid	0.01	0.01	%	09/05/96	pjm
ASTM D 2492-90	Pyritic Sulfur, Solid	0.4	0.3	t CaCO ₃ /kt	09/05/96	pjm
EPA 600 3.1.2-3	Sample Preparation, Solid	Complete			09/05/96	dme
ASTM D 2492-90	Sulfate Sulfur, Solid	<0.01	0.01	%	09/06/96	sgm
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.01	0.01	%	09/13/96	* sl
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.3	0.3	t CaCO ₃ /kt	09/13/96	* sl
ASTM D 2492-90	Unidentified Sulfur, Solid	<0.01	0.01	%	09/05/96	pjm



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Customer Sample ID: E-4
Date Sampled.....: 08/27/96
Time Sampled.....: 00:00
Sample Matrix.....: Soil

Laboratory Sample ID: 962376-4
Date Received.....: 08/28/96
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Extract	40	5	mg/L CaCO ₃	09/19/96	sgm
EPA 325.2	Chloride, Extract	2.3	0.5	mg/L	09/17/96	sgm
EPA 340.2	Fluoride (F), Extract	0.2	0.1	mg/L	09/12/96	dne
EPA 353.2	Nitrate + Nitrite as N, Extract	<0.05	0.05	mg/L	09/19/96	sgm
EPA 365.2	Phosphorous, Total, Extract	0.07	0.01	mg/L	09/15/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Extract	220	10	mg/L	09/12/96	sgm
EPA 375.2	Sulfate (SO ₄), Extract	24	10.	mg/L	09/16/96	sgm
EPA 150.1	pH, Extract	8.21	0.01	pH Units	09/19/96	sgm
SW-846 3010	Acid Digestion, Total Metals	Complete			09/11/96	gag
SW-846 6010A	Aluminum (Al), Total	0.11	0.05	mg/L	09/12/96	gag
SW-846 7041	Antimony (Sb), Total	<0.005	0.005	mg/L	09/11/96	lmt
SW-846 6010A	Arsenic (As), Total	0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Barium (Ba), Total	0.24	0.01	mg/L	09/12/96	gag
SW-846 6010A	Beryllium (Be), Total	<0.001	0.001	mg/L	09/12/96	gag
ASTM 3111B	Bismuth (Bi), Total	<1	1	mg/L	09/12/96	lmt
SW-846 6010A	Boron (B), Total	0.20	0.05	mg/L	09/12/96	gag
SW-846 6010A	Cadmium (Cd), Total	<0.005	0.005	mg/L	09/12/96	gag
SW-846 6010A	Calcium (Ca), Total	27.0	0.1	mg/L	09/12/96	gag
SW-846 6010A	Chromium (Cr), Total	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Cobalt (Co), Total	<0.03	0.03	mg/L	09/12/96	gag
SW-846 6010A	Copper (Cu), Total	<0.01	0.01	mg/L	09/12/96	gag
ASTM 3111B	Gallium (Ga), Total	<0.5	0.5	mg/L	09/12/96	lmt
SW-846 6010A	Iron (Fe), Total	<0.03	0.03	mg/L	09/12/96	gag
SW-846 6010A	Lead (Pb), Total	0.017	0.003	mg/L	09/12/96	gag
SW-846 6010A	Lithium (Li), Total	<0.01	0.01	mg/L	09/12/96	gag



CORE LABORATORIES

LABORATORY TEST RESULTS		
Job Number: 962376		Date: 09/20/96

CUSTOMER: Environmental Management Assoc.	PROJECT: CHEMGOLD 96228	ATTN: Daniel Davis
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Customer Sample ID: E-4	Laboratory Sample ID: 962376-4
Date Sampled.....: 08/27/96	Date Received.....: 08/28/96
Time Sampled.....: 00:00	Time Received.....: 10:00
Sample Matrix.....: Soil	

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Magnesium (Mg), Total	0.7	0.1	mg/L	09/12/96	gag
SW-846 6010A	Manganese (Mn), Total	0.09	0.01	mg/L	09/12/96	gag
SW-846 7470	Mercury (Hg), Total	<0.0002	0.0002	mg/L	09/12/96	lmt
SW-846 6010A	Molybdenum (Mo), Total	<0.05	0.05	mg/L	09/12/96	gag
SW-846 6010A	Nickel (Ni), Total	<0.04	0.04	mg/L	09/12/96	gag
SW-846 6010A	Potassium (K), Total	<5	5	mg/L	09/12/96	gag
SW-846 6010A	Scandium (Sc), Total	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Selenium (Se), Total	0.07	0.01	mg/L	09/12/96	gag
SW-846 6010A	Silver (Ag), Total	<0.01	0.01	mg/L	09/16/96	g
SW-846 6010A	Sodium (Na), Total	21	1	mg/L	09/12/96	gag
SW-846 6010A	Strontium (Sr), Total	0.09	0.01	mg/L	09/12/96	gag
SW-846 7841	Thallium (Tl), Total	<0.002	0.002	mg/L	09/12/96	lmt
SW-846 6010A	Tin (Sn), Total	<0.05	0.05	mg/L	09/12/96	gag
SW-846 6010A	Titanium (Ti), Total	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Vanadium (V), Total	<0.05	0.05	mg/L	09/12/96	gag
SW-846 6010A	Zinc (Zn), Total	0.21	0.01	mg/L	09/12/96	gag
SW-846 1312	1312 Extraction, Solid	Complete			09/10/96	lmt
EPA 600 3.2.3	Acid Neutralization Potential, Solid	26.2	0.1	t CaCO3/kt	09/12/96	sgm
ASTM D 2492-90	Pyritic Sulfur, Solid	0.02	0.01	%	09/05/96	pjm
ASTM D 2492-90	Pyritic Sulfur, Solid	0.6	0.3	t CaCO3/kt	09/05/96	pjm
EPA 600 3.1.2-3	Sample Preparation, Solid	Complete			09/05/96	dme
ASTM D 2492-90	Sulfate Sulfur, Solid	<0.01	0.01	%	09/06/96	sgm
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.01	0.01	%	09/13/96	* sl
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.3	0.3	t CaCO3/kt	09/13/96	* sl
ASTM D 2492-90	Unidentified Sulfur, Solid	<0.01	0.01	%	09/05/96	pjm



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Customer Sample ID: E-5
Date Sampled.....: 08/27/96
Time Sampled.....: 00:00
Sample Matrix.....: Soil

Laboratory Sample ID: 962376-5
Date Received.....: 08/28/96
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 600 3.2.3	Acid Neutralization Potential, Solid	3.1	0.1	t CaCO3/kt	09/12/96	sgm
ASTM D 2492-90	Pyritic Sulfur, Solid	<0.01	0.01	%	09/05/96	pjm
ASTM D 2492-90	Pyritic Sulfur, Solid	<0.3	0.3	t CaCO3/kt	09/05/96	pjm
EPA 600 3.1.2-3	Sample Preparation, Solid	Complete			09/05/96	dne
ASTM D 2492-90	Sulfate Sulfur, Solid	<0.01	0.01	%	09/06/96	sgm
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.01	0.01	%	09/13/96	* sl
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.3	0.3	t CaCO3/kt	09/13/96	* sl
ASTM D 2492-90	Unidentified Sulfur, Solid	<0.01	0.01	%	09/05/96	pjm



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Customer Sample ID: E-6
Date Sampled.....: 08/27/96
Time Sampled.....: 00:00
Sample Matrix.....: Soil

Laboratory Sample ID: 962376-6
Date Received.....: 08/28/96
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 600 3.2.3	Acid Neutralization Potential, Solid	<0.1	0.1	t CaCO3/kt	09/16/96	dme
ASTM D 2492-90	Pyritic Sulfur, Solid	0.02	0.01	%	09/05/96	pjm
ASTM D 2492-90	Pyritic Sulfur, Solid	0.5	0.3	t CaCO3/kt	09/05/96	pjm
EPA 600 3.1.2-3	Sample Preparation, Solid	Complete			09/05/96	dme
ASTM D 2492-90	Sulfate Sulfur, Solid	<0.01	0.01	%	09/06/96	sgm
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.01	0.01	%	09/13/96	* sl
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.3	0.3	t CaCO3/kt	09/13/96	* sl
ASTM D 2492-90	Unidentified Sulfur, Solid	<0.01	0.01	%	09/05/96	pjm



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Customer Sample ID: W-1
Date Sampled.....: 08/27/96
Time Sampled.....: 00:00
Sample Matrix.....: Soil

Laboratory Sample ID: 962376-7
Date Received.....: 08/28/96
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 600 3.2.3	Acid Neutralization Potential, Solid	68.8	0.1	t CaCO3/kt	09/16/96	dme
ASTM D 2492-90	Pyritic Sulfur, Solid	<0.01	0.01	%	09/05/96	pjm
ASTM D 2492-90	Pyritic Sulfur, Solid	<0.3	0.3	t CaCO3/kt	09/05/96	pjm
EPA 600 3.1.2-3	Sample Preparation, Solid	Complete			09/05/96	dme
ASTM D 2492-90	Sulfate Sulfur, Solid	<0.01	0.01	%	09/06/96	sgm
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.01	0.01	%	09/13/96	* sl
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.3	0.3	t CaCO3/kt	09/13/96	* sl
ASTM D 2492-90	Unidentified Sulfur, Solid	<0.01	0.01	%	09/05/96	pjm



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Customer Sample ID: W-2
Date Sampled.....: 08/27/96
Time Sampled.....: 00:00
Sample Matrix.....: Soil

Laboratory Sample ID: 962376-8
Date Received.....: 08/28/96
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Extract	34	5	mg/L CaCO ₃	09/19/96	sgm
EPA 325.2	Chloride, Extract	0.8	0.5	mg/L	09/17/96	sgm
EPA 340.2	Fluoride (F), Extract	0.1	0.1	mg/L	09/12/96	dme
EPA 353.2	Nitrate + Nitrite as N, Extract	<0.05	0.05	mg/L	09/19/96	sgm
EPA 365.2	Phosphorous, Total, Extract	0.05	0.01	mg/L	09/15/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Extract	250	10	mg/L	09/12/96	sgm
EPA 375.2	Sulfate (SO ₄), Extract	<10.	10.	mg/L	09/16/96	sgm
EPA 150.1	pH, Extract	8.21	0.01	pH Units	09/19/96	sgm
SW-846 3010	Acid Digestion, Total Metals	Complete			09/11/96	g
SW-846 6010A	Aluminum (Al), Total	0.32	0.05	mg/L	09/12/96	gag
SW-846 7041	Antimony (Sb), Total	<0.005	0.005	mg/L	09/11/96	lmt
SW-846 6010A	Arsenic (As), Total	0.02	0.01	mg/L	09/12/96	gag
SW-846 6010A	Barium (Ba), Total	0.21	0.01	mg/L	09/12/96	gag
SW-846 6010A	Beryllium (Be), Total	<0.001	0.001	mg/L	09/12/96	gag
ASTM 3111B	Bismuth (Bi), Total	<1	1	mg/L	09/12/96	lmt
SW-846 6010A	Boron (B), Total	0.13	0.05	mg/L	09/12/96	gag
SW-846 6010A	Cadmium (Cd), Total	<0.005	0.005	mg/L	09/12/96	gag
SW-846 6010A	Calcium (Ca), Total	11.8	0.1	mg/L	09/12/96	gag
SW-846 6010A	Chromium (Cr), Total	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Cobalt (Co), Total	<0.03	0.03	mg/L	09/12/96	gag
SW-846 6010A	Copper (Cu), Total	<0.01	0.01	mg/L	09/12/96	gag
ASTM 3111B	Gallium (Ga), Total	<0.5	0.5	mg/L	09/12/96	lmt
SW-846 6010A	Iron (Fe), Total	0.15	0.03	mg/L	09/12/96	gag
SW-846 6010A	Lead (Pb), Total	0.005	0.003	mg/L	09/12/96	gag
SW-846 6010A	Lithium (Li), Total	<0.01	0.01	mg/L	09/12/96	gag



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Customer Sample ID: W-2
Date Sampled.....: 08/27/96
Time Sampled.....: 00:00
Sample Matrix.....: Soil

Laboratory Sample ID: 962376-8
Date Received.....: 08/28/96
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Magnesium (Mg), Total	0.8	0.1	mg/L	09/12/96	gag
SW-846 6010A	Manganese (Mn), Total	0.04	0.01	mg/L	09/12/96	gag
SW-846 7470	Mercury (Hg), Total	0.0004	0.0002	mg/L	09/12/96	lmt
SW-846 6010A	Molybdenum (Mo), Total	<0.05	0.05	mg/L	09/12/96	gag
SW-846 6010A	Nickel (Ni), Total	<0.04	0.04	mg/L	09/12/96	gag
SW-846 6010A	Potassium (K), Total	<5	5	mg/L	09/12/96	gag
SW-846 6010A	Scandium (Sc), Total	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Selenium (Se), Total	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Silver (Ag), Total	<0.01	0.01	mg/L	09/16/96	gag
SW-846 6010A	Sodium (Na), Total	6	1	mg/L	09/12/96	gag
SW-846 6010A	Strontium (Sr), Total	0.35	0.01	mg/L	09/12/96	gag
SW-846 7841	Thallium (Tl), Total	<0.002	0.002	mg/L	09/12/96	lmt
SW-846 6010A	Tin (Sn), Total	<0.05	0.05	mg/L	09/12/96	gag
SW-846 6010A	Titanium (Ti), Total	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Vanadium (V), Total	<0.05	0.05	mg/L	09/12/96	gag
SW-846 6010A	Zinc (Zn), Total	0.19	0.01	mg/L	09/12/96	gag
SW-846 1312	1312 Extraction, Solid	Complete			09/10/96	lmt
EPA 600 3.2.3	Acid Neutralization Potential, Solid	42.1	0.1	t CaCO3/kt	09/12/96	sgm
ASTM D 2492-90	Pyritic Sulfur, Solid	0.01	0.01	%	09/05/96	pjm
ASTM D 2492-90	Pyritic Sulfur, Solid	0.4	0.3	t CaCO3/kt	09/05/96	pjm
EPA 600 3.1.2-3	Sample Preparation, Solid	Complete			09/05/96	dme
ASTM D 2492-90	Sulfate Sulfur, Solid	<0.01	0.01	%	09/06/96	sgm
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.01	0.01	%	09/13/96	* sl
ASTM D4239-85C	Total Sulfur (Leco), Solid	<0.3	0.3	t CaCO3/kt	09/13/96	* sl
ASTM D 2492-90	Unidentified Sulfur, Solid	<0.01	0.01	%	09/05/96	pjm



CORE LABORATORIES

LABORATORY TEST RESULTS						
Job Number: 962376			Date: 09/20/96			
CUSTOMER: Environmental Management Assoc.		PROJECT: CHEMGOLD 96228		ATTN: Daniel Davis		
Customer Sample ID: W-3 Date Sampled.....: 08/27/96 Time Sampled.....: 00:00 Sample Matrix.....: Soil			Laboratory Sample ID: 962376-9 Date Received.....: 08/28/96 Time Received.....: 10:00			
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 600 3.2.3	Acid Neutralization Potential, Solid	31.0	0.1	t CaCO3/kt	09/12/96	sgm
ASTM D 2492-90	Pyritic Sulfur, Solid	0.01	0.01	%	09/05/96	pjm
ASTM D 2492-90	Pyritic Sulfur, Solid	0.4	0.3	t CaCO3/kt	09/05/96	pjm
EPA 600 3.1.2-3	Sample Preparation, Solid	Complete			09/05/96	dme
ASTM D 2492-90	Sulfate Sulfur, Solid	<0.01	0.01	%	09/06/96	sgm
ASTM D4239-85C	Total Sulfur (Leco), Solid	0.05	0.01	%	09/13/96	* sl
ASTM D4239-85C	Total Sulfur (Leco), Solid	1.6	0.3	t CaCO3/kt	09/13/96	* sl
ASTM D 2492-90	Unidentified Sulfur, Solid	0.04	0.01	%	09/05/96	pjm



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: ASTM D 2492-90
Method Description.: Sulfur, Forms of
Parameter.....: Sulfate Sulfur

Batch.....: 13014
Detection Limit....: 0.01
Units.....: %

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
MB			0.00							09/06/96 0830
MD	962312-1		0.00			0.00	0	ABS Diff.		09/06/96 0830

Test Method.....: SW-846 7470
Method Description.: Mercury (CVAA)
Parameter.....: Mercury (Hg)

Batch.....: 13125
Detection Limit....: 0.0002
Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960624G	0.004277		0.004000		106.9	% REC		09/12/96 0915
ICB		09126	0.000052							09/12/96 0916
MB		0911	0.000052							09/12/96 0919
MD	962346-3		0.000146			0.000146	0.00000	ABS Diff.		09/12/96 0921
MS	962346-4	950929N	0.005169		0.005000	0.000146	100.5	% REC		09/12/96 0923
CCV		950929N	0.005122		0.005000		102.4	% REC		09/12/96 0925
CCB		09126	0.000052							09/12/96 0926
		0911	0.000052							09/12/96 0934
		1320	0.000099							09/12/96 0934
CCV		950929N	0.004981		0.005000		99.6	% REC		09/12/96 0935
CCB		09126	0.000052							09/12/96 0936
SB		950929N	0.005310		0.005000		106.2	% REC		09/12/96 0937
ED	962377-22		0.000052			0.000052	0.00000	ABS Diff.		09/12/96 0941
MD	962377-32		0.000052			0.000052	0.00000	ABS Diff.		09/12/96 0942
MS	962377-42	950929N	0.005310		0.005000	0.000052	105.2	% REC		09/12/96 0944
CCV		950929N	0.005216		0.005000		104.3	% REC		09/12/96 0946
CCB		09126	0.000052							09/12/96 0947
EB		1320	0.000052							09/12/96 0948
SB		950929N	0.004794		0.005000		95.9	% REC		09/12/96 0949
ED	962377-23		0.000052			0.000052	0.00000	ABS Diff.		09/12/96 0952
MD	962377-33		0.000052			0.000052	0.00000	ABS Diff.		09/12/96 0954
MS	962377-43	950929N	0.005263		0.005000	0.000052	104.2	% REC		09/12/96 0956
CCV		950929N	0.004981		0.005000		99.6	% REC		09/12/96 0956
CCB		09126	0.000052							09/12/96 0957
EB		1312	0.000052							09/12/96 0959
SB		950929N	0.004841		0.005000		96.8	% REC		09/12/96 1000
ED	962376-4		0.000052			0.000052	0.00000	ABS Diff.		09/12/96 1003
MD	962376-4		0.000052			0.000052	0.00000	ABS Diff.		09/12/96 1004
MS	962376-8	950929N	0.005216		0.005000	0.000428	95.8	% REC		09/12/96 1005
CCV		950929N	0.005310		0.005000		106.2	% REC		09/12/96 1007
CCB		09126	0.000052							09/12/96 1008
MD	962416-1		0.000052			0.000052	0.00000	ABS Diff.		09/12/96 1009
MS	962416-2	950929N	0.005216		0.005000	0.000052	103.3	% REC		09/12/96 1011
CCV		950929N	0.005263		0.005000		105.3	% REC		09/12/96 1014
CCB		09126	0.000052							09/12/96 1015



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: ASTM 3111B

Method Description.: Bismuth & Gallium (FLAA)

Parameter.....: Bismuth (Bi)

Batch.....: 13157

Detection Limit....: 1

Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		951219D	19.70		20.04		98.3	% REC		09/12/96 1610
ICB		09126	0.04							09/12/96 1610
MB		0906	0.63							09/12/96 1611
EB		1320	0.41							09/12/96 1611
SB		950727	9.66		10.020000		96.4	% REC		09/12/96 1612
MD	962377-1		0.34			0.58	0.24	ABS Diff.		09/12/96 1613
ED	962377-21		0.46			0.46	0.00	ABS Diff.		09/12/96 1613
MS	962377-31	950727	10.74		10.020000	0.61	101.1	% REC		09/12/96 1614
CCV		960909G	25.58		25.000000		102.3	% REC		09/12/96 1615
CCB		09126	0.42							09/12/96 1616
EB		0907	0.51							09/12/96 1616
SB		950727	10.44		10.020000		104.2	% REC		09/12/96 1616
SD	962377-13		0.61			0.71		% Diff.		09/12/96 1618
ED	962377-23		0.62			0.62	0.00	ABS Diff.		09/12/96 1619
MD	962377-33		0.62			0.57	0.05	ABS Diff.		09/12/96 1619
CCV		960909G	25.44		25.000000		101.8	% REC		09/12/96 1620
CCB		09126	0.56							09/12/96 1621
MS	962377-43	950727	10.97		10.020000	0.61	103.4	% REC		09/12/96 1621
EB		0910	0.62							09/12/96 1621
SB		950727	9.56		10.020000		95.4	% REC		09/12/96 1622
MS	962377-14	950727	20.90		20.040000	0.75	100.5	% REC		09/12/96 1624
ED	962377-24		0.74			0.67	0.07	ABS Diff.		09/12/96 1625
CCV		960909G	25.42		25.000000		101.7	% REC		09/12/96 1625
CCB		09126	0.53							09/12/96 1626
EB		0911	0.65							09/12/96 1627
SB		950727	9.40		10.020000		93.8	% REC		09/12/96 1628
MS	962377-5	950727	11.06		10.020000	0.46	105.8	% REC		09/12/96 1628
MD	962377-25		0.66			0.59	0.07	ABS Diff.		09/12/96 1630
ED	962377-25		0.66			0.59	0.07	ABS Diff.		09/12/96 1630
CCV		960909G	25.05		25.000000		100.2	% REC		09/12/96 1631
CCB		09126	0.57							09/12/96 1631
SD	962377-35		0.60			0.76		% Diff.		09/12/96 1632
EB		1312	0.55							09/12/96 1633
SB		950727	10.64		10.020000		106.2	% REC		09/12/96 1634
MS	962376-2	950727	10.94		10.020000	0.74	101.8	% REC		09/12/96 1634
ED	962376-4		0.56			0.63	0.07	ABS Diff.		09/12/96 1635
CCV		960909G	25.56		25.000000		102.2	% REC		09/12/96 1636
CCB		09126	0.66							09/12/96 1636
MD	962376-4		0.80			0.63	0.17	ABS Diff.		09/12/96 1637
CCV		960909G	24.98		25.000000		99.9	% REC		09/12/96 1637
CCB		09126	0.45							09/12/96 1638
MB		0911	0.55							09/12/96 1638
MB		0911	0.48							09/12/96 1639
MD	962377-34		0.71			0.78	0.07	ABS Diff.		09/12/96 1639
CCV		960909G	25.45		25.000000		101.8	% REC		09/12/96 1640
CCB		09126	0.71							09/12/96 1640



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: EPA 340.2

Method Description.: Fluoride (ISE)

Parameter.....: Fluoride (F)

Batch.....: 13170

Detection Limit....: 0.1

Units.....: mg/L

Analyst....: dne

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICL		G960621B	4.2		4.000000		105.0	% REC		09/12/96 1400
LCS		G960621B	0.2		0.200000		100.0	% REC		09/12/96 1400
ICB			0.0							09/12/96 1400
ED	962376-4		0.2			0.2	0.0	ABS Diff.		09/12/96 1400
MD	962376-8		0.1			0.1	0.0	ABS Diff.		09/12/96 1400
MS	962376-8	G960621A	1.2		1.000000	0.1	110.0	% REC		09/12/96 1400
EB			0.0							09/12/96 1400
CCV		G960621A	3.0		3.000003		100.0	% REC		09/12/96 1400
CCB			0.0							09/12/96 1400
MD	962377-15		0.0			0.0	0	ABS Diff.		09/12/96 1400
MS	962377-15	G960621A	1.0		1.000000	0.0	100.0	% REC		09/12/96 1400
ED	962377-24		0.2			0.2	0.0	ABS Diff.		09/12/96 1400
ED	962377-25		0.0			0.0	0	ABS Diff.		09/12/96 1400
CCV		G960621A	2.9		3.000003		96.7	% REC		09/12/96 1400
CCB			0.0							09/12/96 1400
MD	962377-35		0.4			0.4	0.0	ABS Diff.		09/12/96 1400
MS	962377-35	G960621A	1.4		1.000000	0.4	100.0	% REC		09/12/96 1400
		G960621A	3.0		3.000003		100.0	% REC		09/12/96 1400
			0.0							09/12/96 1400
LD			0.0							09/12/96 1400
EB			0.0							09/12/96 1400
EB			0.0							09/12/96 1400
EB			0.0							09/12/96 1400
LCS		G960621B	4.2		4.000000		105.0	% REC		09/12/96 1400
CCV		G960621A	3.0		3.000003		100.0	% REC		09/12/96 1400
CCB			0.0							09/12/96 1400

Test Method.....: ASTM D4239-85C

Method Description.: Total Sulfur (Leco)

Parameter.....: Total Sulfur (Leco)

Batch.....: 13174

Detection Limit....: 0.01

Units.....: %

Analyst....: * sl

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
LCS		CHANNEL #3	4.61		4.63		99.6	% REC		09/13/96 1036

Test Method.....: ASTM D4239-85C

Method Description.: Total Sulfur (Leco)

Parameter.....: Total Sulfur (Leco)

Batch.....: 13174

Detection Limit....: 0.3

Units.....: t CaCO3/kt

Analyst....: * sl

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
LCS		CHANNEL #3	144		145		99.3	% REC		09/13/96 1036

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Lithium (Li)

Batch.....: 13175

Detection Limit....: 0.01

Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
/		960910M	1.93685		2.000		96.8	% REC		09/12/96 1021



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Lithium (Li)

Batch.....: 13175

Detection Limit....: 0.01

Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICB		960729M	0.00123							09/12/96 1040
ISB		960630H	1.09441		1.000		109.4	% REC		09/12/96 1055
MB		0911	0.00452							09/12/96 1111
EB		0910	0.00452							09/12/96 1117
SB		960630G	0.96904		1.000		96.9	% REC		09/12/96 1239
MS	962377-14	960630G	1.98914		2.000000	0.00656	99.1	% REC		09/12/96 1249
PDS	962377-14	960630G	0.94601		1.000	0.00656	93.9	% REC		09/12/96 1254
CCV		960620BB	2.40533		2.500		96.2	% REC		09/12/96 1304
CCV		960620AA	2.52426		2.5		101.0	% REC		09/12/96 1313
CCB		960729M	0.00288							09/12/96 1324
CCV		960620BB	2.43620		2.500		97.4	% REC		09/12/96 1418
CCV		960620AA	2.46623		2.5		98.6	% REC		09/12/96 1420
CCB		960729M	0.00823							09/12/96 1424
ED	962377-24		0.00863			0.00905	0.00042	ABS Diff.		09/12/96 1432
MD	962377-34		0.00829			0.00788	0.00041	ABS Diff.		09/12/96 1451
EB		0911	0.00288							09/12/96 1504
SB		960630G	1.00362		1.000		100.4	% REC		09/12/96 1507
MS	962377-5	960630G	1.02134		1.000	0.01113	101.0	% REC		09/12/96 151
CCV		960620BB	2.38063		2.500		95.2	% REC		09/12/96 152
CCB		960729M	0.00987							09/12/96 152.
PDS	962377-5	960630G	0.92254		1.000	0.01113	91.1	% REC		09/12/96 1539
ED	962377-25		0.00600			0.01147	0.00547	ABS Diff.		09/12/96 1551
MD	962377-25		0.00859			0.01147	0.00288	ABS Diff.		09/12/96 1554
CCV		960620BB	2.37898		2.500		95.2	% REC		09/12/96 1612
CCV		960620AA	2.46705		2.5		98.7	% REC		09/12/96 1615
CCB		960729M	0.00905							09/12/96 1619
MD	962419-2		0.07750			0.07708	0.5	RPD		09/12/96 1625
PDS	962419-5	960630G	1.07672		1.000	0.05046	102.6	% REC		09/12/96 1631
ISB		960630H	1.08351		1.000		108.4	% REC		09/12/96 1749
CCV		960620BB	2.49794		2.500		99.9	% REC		09/12/96 1752
CCV		960620AA	2.60370		2.5		104.1	% REC		09/12/96 1755
CCB		960729M	0.00576							09/12/96 1759
MB		0911	0.00411							09/12/96 1842
EB		0907	0.00164							09/12/96 1848
SB		960630G	1.03737		1.000		103.7	% REC		09/12/96 1850
ED	962377-23		0.00330			0.00371	0.00041	ABS Diff.		09/12/96 1914
MD	962377-33		0.00664			0.00582	0.00082	ABS Diff.		09/12/96 1919
CCV		960620BB	2.46953		2.500		98.8	% REC		09/12/96 1922
CCV		960620AA	2.57530		2.5		103.0	% REC		09/12/96 1925
CCB		960729M	0.00246							09/12/96 1937
MS	962377-43	960630G	1.06745		1.000	0.00001	106.7	% REC		09/12/96 1944
PDS	962377-43	960630G	1.06292		1.000	0.00001	106.3	% REC		09/12/96 1952
EB		0910	-0.00041							09/12/96 1959
SB		960630G	1.00486		1.000		100.5	% REC		09/12/96 2005
MS	962376-2	960630G	1.04936		1.000	0.00950	104.0	% REC		09/12/96 2011
PDS	962376-2	960630G	1.13415		1.000	0.00950	112.5	% REC		09/12/96 2021
CCV		960620BB	2.44854		2.500		97.9	% REC		09/12/96 2027
CCB		960729M	-0.00123							09/12/96 2040
ED	962376-4		0.00665			0.00335	0.00330	ABS Diff.		09/12/96 2059
MD	962376-4		0.00623			0.00335	0.00288	ABS Diff.		09/12/96 2102
CCV		960620BB	2.41355		2.500		96.5	% REC		09/12/96 2139
CCV		960620AA	2.51068		2.5		100.4	% REC		09/12/96 214
CCB		960729M	0.00329							09/12/96 214



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
 Method Description.: Metals Analysis (ICAP)
 Parameter.....: Lithium (Li)

Batch.....: 13175
 Detection Limit...: 0.01
 Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
CCV		960620BB	2.40490		2.500		96.2	% REC		09/12/96 2337
CCV		960620AA	2.59630		2.5		103.9	% REC		09/12/96 2340
CCB		960729M	0.00329							09/12/96 2348
ISB		960630H	1.07834		1.000		107.8	% REC		09/12/96 2356
CCV		960620BB	2.45265		2.500		98.1	% REC		09/13/96 0013
CCV		960620AA	2.64899		2.5		106.0	% REC		09/13/96 0016
CCB		960729M	0.00494							09/13/96 0019

Test Method.....: SW-846 6010A
 Method Description.: Metals Analysis (ICAP)
 Parameter.....: Scandium (Sc)

Batch.....: 13175
 Detection Limit...: 0.01
 Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960910M	1.87620		2.000		93.8	% REC		09/12/96 1021
ICB		960729M	0.00058							09/12/96 1040
		960630H	1.07845		1.000		107.8	% REC		09/12/96 1055
		0911	0.00117							09/12/96 1111
		0910	0.00058							09/12/96 1117
SB		960630G	0.94735		1.000		94.7	% REC		09/12/96 1239
MS	962377-14	960630G	1.93985		2.000000	0.00058	97.0	% REC		09/12/96 1249
PDS	962377-14	960630G	0.91685		1.000	0.00058	91.6	% REC		09/12/96 1254
CCV		960620BB	2.30252		2.500		92.1	% REC		09/12/96 1304
CCB		960729M	0.00058							09/12/96 1324
CCV		960620BB	2.32569		2.500		93.0	% REC		09/12/96 1418
CCB		960729M	0.00058							09/12/96 1424
ED	962377-24		0.00058			0.00058	0.00000	ABS Diff.		09/12/96 1432
MD	962377-34		0.00146			0.00058	0.00088	ABS Diff.		09/12/96 1451
EB		0911	0.00058							09/12/96 1504
SB		960630G	0.99074		1.000		99.1	% REC		09/12/96 1507
MS	962377-5	960630G	1.00277		1.000	0.00088	100.2	% REC		09/12/96 1517
CCV		960620BB	2.30340		2.500		92.1	% REC		09/12/96 1522
CCB		960729M	0.00058							09/12/96 1529
PDS	962377-5	960630G	0.91158		1.000	0.00088	91.1	% REC		09/12/96 1539
ED	962377-25		0.00088			0.00088	0.00000	ABS Diff.		09/12/96 1551
MD	962377-25		0.00088			0.00088	0.00000	ABS Diff.		09/12/96 1554
CCV		960620BB	2.27701		2.500		91.1	% REC		09/12/96 1612
CCB		960729M	0.00058							09/12/96 1619
MD	962419-2		0.00175			0.00205	0.00030	ABS Diff.		09/12/96 1625
PDS	962419-5	960630G	1.00363		1.000	0.00058	100.3	% REC		09/12/96 1631
ISB		960630H	1.01132		1.000		101.1	% REC		09/12/96 1749
CCV		960620BB	2.34299		2.500		93.7	% REC		09/12/96 1752
CCB		960729M	0.00000							09/12/96 1759
MB		0911	0.00029							09/12/96 1842
EB		0907	0.00000							09/12/96 1848
SB		960630G	0.99573		1.000		99.6	% REC		09/12/96 1850
ED	962377-23		0.00000			0.00000	0	ABS Diff.		09/12/96 1914
MD	962377-33		0.00000			0.00000	0	ABS Diff.		09/12/96 1919
CCV		960620BB	2.25678		2.500		90.3	% REC		09/12/96 1922
CCB		960729M	0.00000							09/12/96 1937
	962377-43	960630G	1.00365		1.000	0.00000	100.4	% REC		09/12/96 1944
	962377-43	960630G	1.01010		1.000	0.00000	101.0	% REC		09/12/96 1952



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Scandium (Sc)

Batch.....: 13175
Detection Limit....: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
EB		0910	0.00000							09/12/96 1959
SB		960630G	0.97256		1.000		97.3	% REC		09/12/96 2005
MS	962376-2	960630G	1.00218		1.000	0.00117	100.1	% REC		09/12/96 2011
PDS	962376-2	960630G	1.05730		1.000	0.00117	105.6	% REC		09/12/96 2021
CCV		9606208B	2.46451		2.500		98.6	% REC		09/12/96 2027
CCB		960729M	0.00000							09/12/96 2040
ED	962376-4		0.00000			0.00000	0	ABS Diff.		09/12/96 2059
MD	962376-4		0.00000			0.00000	0	ABS Diff.		09/12/96 2102
CCV		9606208B	2.44628		2.500		97.9	% REC		09/12/96 2139
CCB		960729M	0.00032							09/12/96 2147
CCV		9606208B	2.41991		2.500		96.8	% REC		09/12/96 2337
CCB		960729M	0.00032							09/12/96 2348
ISB		960630H	1.11773		1.000		111.8	% REC		09/12/96 2356
CCV		9606208B	2.46939		2.500		98.8	% REC		09/13/96 0013
CCB		960729M	0.00000							09/13/96 0019

Test Method.....: SW-846 7041
Method Description.: Antimony (GFAA)
Parameter.....: Antimony (Sb)

Batch.....: 13194
Detection Limit....: 0.002
Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960911B	0.04071		0.0400		101.8	% REC		09/11/96 1155
ICB		09116	-0.00024							09/11/96 1204
MB		0906	0.00054							09/11/96 1214
EB		1320	0.00033							09/11/96 1218
SB		960624L	0.02191		0.020000		109.5	% REC		09/11/96 1222
SD	962377-1		0.00174			0.00053		% Diff.		09/11/96 1229
MS	962377-11	960624L	0.01845		0.020000	0.00081	88.2	% REC		09/11/96 1237
ED	962377-21		0.00020			0.00043	0.00023	ABS Diff.		09/11/96 1249
CCV		960911C	0.05298		0.050		106.0	% REC		09/11/96 1252
CCB		09116	0.00004							09/11/96 1256
EB		1320	0.00061							09/11/96 1312
SB		960624L	0.00201		0.020000		10.1	% REC		09/11/96 1316
MS	962377-2	960624L	0.01949		0.020000	0.00058	94.5	% REC		09/11/96 1323
MD	962377-22		0.00084			0.00120	0.00036	ABS Diff.		09/11/96 1335
CCV		960911C	0.05258		0.050		105.2	% REC		09/11/96 1339
CCB		09116	0.00091							09/11/96 1343
ED	962377-22		0.00058			0.00120	0.00062	ABS Diff.		09/11/96 1346
MB		0910	-0.00025							09/11/96 1402
EB		1320	-0.00100							09/11/96 1411
SB		960624L	0.00123		0.020000		6.2	% REC		09/11/96 1415
MS	962377-13	960624L	0.01754		0.020000	0.00058	84.8	% REC		09/11/96 1427
CCV		960911C	0.05269		0.050		105.4	% REC		09/11/96 1430
CCB		09116	0.00027							09/11/96 1434
ED	962377-23		0.00071			0.00099	0.00028	ABS Diff.		09/11/96 1442
MD	962377-33		-0.00016			0.00152	0.00168	ABS Diff.		09/11/96 1450
CCV		960911C	0.05291		0.050		105.8	% REC		09/11/96 1610
CCB		09116	-0.00199							09/11/96 1614
EB		1320	0.00106							09/11/96 1618
SB		960624L	0.00049		0.020000		2.5	% REC		09/11/96 162
MS	962377-4	960624L	0.01944		0.020000	-0.00049	99.7	% REC		09/11/96 162



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 7041

Batch.....: 13194

Analyst....: lmt

Method Description.: Antimony (GFAA)

Detection Limit....: 0.002

Parameter.....: Antimony (Sb)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
SD	962377-14		0.00068			0.00040		% Diff.		09/11/96 1637
ED	962377-24		0.00044			0.00070	0.00026	ABS Diff.		09/11/96 1644
MD	962377-24		0.00219			0.00070	0.00149	ABS Diff.		09/11/96 1648
CCV		960911C	0.05357		0.050		107.1	% REC		09/11/96 1656
CCB		09116	0.00114							09/11/96 1700
EB		1312	0.00080							09/11/96 1713
SB		960624L	0.00095		0.020000		4.8	% REC		09/11/96 1717
MS	962376-2	960624L	0.02012		0.020000	0.00014	99.9	% REC		09/11/96 1724
ED	962376-4		0.00156			0.00061	0.00095	ABS Diff.		09/11/96 1732
MD	962376-4		0.00004			0.00061	0.00057	ABS Diff.		09/11/96 1736
CCV		960911C	0.05302		0.050		106.0	% REC		09/11/96 1744
CCB		09116	0.00024							09/11/96 1747
CCV		960911C	0.05296		0.050		105.9	% REC		09/11/96 1755
CCB		09116	0.00091							09/11/96 1759
CCV		960911C	0.05384		0.050		107.7	% REC		09/11/96 1902
CCB		09116	0.00108							09/11/96 1906
SB		960624L	0.02169		0.020000		108.5	% REC		09/11/96 1910
		960624L	0.02097		0.020000		104.8	% REC		09/11/96 1914
	962419-1		0.00132			-0.00059	0.00191	ABS Diff.		09/11/96 1921
	962419-5	960716G	0.01882		0.020000	0.00108	88.7	% REC		09/11/96 1933
SD	962419-6		0.00073			0.00047		% Diff.		09/11/96 1941
CCV		960911C	0.05328		0.050		106.6	% REC		09/11/96 1948
CCB		09116	0.00054							09/11/96 1952

Test Method.....: SW-846 7841

Batch.....: 13198

Analyst....: lmt

Method Description.: Thallium (GFAA)

Detection Limit....: 0.005

Parameter.....: Thallium (Tl)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960722B	0.03892		0.0400		97.3	% REC		09/12/96 0956
ICB		09126	0.000000							09/12/96 1002
CCV		960722C	0.04880		0.050		97.6	% REC		09/12/96 1110
CCB		09126	0.00012							09/12/96 1116
CCV		960722C	0.04863		0.050		97.3	% REC		09/12/96 1217
CCB		09126	0.00051							09/12/96 1223
CCV		960722C	0.05003		0.050		100.1	% REC		09/12/96 1324
CCB		09126	0.00023							09/12/96 1330
CCV		960722C	0.04951		0.050		99.0	% REC		09/12/96 1352
CCB		09126	0.00052							09/12/96 1358
MB		0910	0.00037							09/12/96 1410
EB		1320	0.00073							09/12/96 1413
EB		960912H	0.02272		1.000					09/12/96 1416
SB		960624L	0.00111		0.020000		5.5	% REC		09/12/96 1419
SD	962377-3		-0.00025			0.00143		% Diff.		09/12/96 1424
MS	962377-13	960624L	0.02134		0.020000	0.00042	104.6	% REC		09/12/96 1430
ED	962377-23		-0.00085			0.00066	0.00151	ABS Diff.		09/12/96 1436
CCV		960722C	0.05058		0.050		101.2	% REC		09/12/96 1439
CCB		09126	-0.00041							09/12/96 1442
MD	962377-33		-0.00020			0.00029	0.00049	ABS Diff.		09/12/96 1447
		1320	0.00011							09/12/96 1456
		960912H	0.02039		1.000					09/12/96 1459



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 7841

Method Description.: Thallium (GFAA)

Parameter.....: Thallium (Tl)

Batch.....: 13198

Detection Limit....: 0.005

Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
SB		960624L	0.00075		0.020000		3.8	% REC		09/12/96 1502
MS	962377-4	960624L	0.02133		0.020000	0.00009	106.2	% REC		09/12/96 1507
CCV		960722C	0.05208		0.050		104.2	% REC		09/12/96 1513
CCB		09126	0.00061							09/12/96 1516
ED	962377-24		0.00044			-0.00011	0.00055	ABS Diff.		09/12/96 1522
MD	962377-24		0.00142			-0.00011	0.00153	ABS Diff.		09/12/96 1524
EB		1312	0.00055							09/12/96 1536
EB		960912H	0.02316		1.000					09/12/96 1539
SB		960624L	0.00073		0.020000		3.6	% REC		09/12/96 1542
CCV		960722C	0.05083		0.050		101.7	% REC		09/12/96 1547
CCB		09126	0.00070							09/12/96 1550
MS	962376-2	960624L	0.02089		0.020000	0.00077	100.6	% REC		09/12/96 1553
ED	962377-4		0.00061			0.00009	0.00052	ABS Diff.		09/12/96 1559
MD	962376-4		0.00021			0.00096	0.00075	ABS Diff.		09/12/96 1602
CCV		960722C	0.05101		0.050		102.0	% REC		09/12/96 1608
CCB		09126	0.00079							09/12/96 1610

Test Method.....: EPA 160.1

Method Description.: Solids, Total Dissolved (TDS)

Parameter.....: Solids, Total Dissolved (TDS)

Batch.....: 13230

Detection Limit....: 10

Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
MB			0							09/12/96 1600
LCS		G960724A	504		500		100.8	% REC		09/12/96 1600
ED	962376-4		204			225	9.8	RPD		09/12/96 1600
ED	962377-24		36			29	7	ABS Diff.		09/12/96 1600
ED	962377-25		37			29	8	ABS Diff.		09/12/96 1600
EB			0							09/12/96 1600
EB			0							09/12/96 1600
EB			0							09/12/96 1600

Test Method.....: EPA 600 3.2.3

Method Description.: Acid Neutralization Potential

Parameter.....: Acid Neutralization Potential

Batch.....: 13244

Detection Limit....: 0.1

Units.....: t CaCO3/kt

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
MB			0							09/11/96 0900
MD	962376-1		37.2			36.4	2.2	RPD		09/11/96 1408
MD	962376-2		20.5			20.5	0.0	RPD		09/11/96 1916

Test Method.....: EPA 365.2

Method Description.: Phosphorous, All Forms

Parameter.....: Phosphorous, Total

Batch.....: 13263

Detection Limit....: 0.01

Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
MB			0.00							09/15/96 1000
ICB			0.00							09/15/96 1000



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: EPA 365.2

Method Description.: Phosphorous, All Forms

Parameter.....: Phosphorous, Total

Batch.....: 13263

Detection Limit....: 0.01

Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
LCS		G960219A	0.33		0.323000		102.2	% REC		09/15/96 1000
DSC		G960702A	0.21		0.200000		105.0	% REC		09/15/96 1000
ICV		G960219A	0.33		0.323000		102.2	% REC		09/15/96 1000
EB			0.00							09/15/96 1000
ED	962376-4		0.08			0.07	13.3	RPD		09/15/96 1000
CCV		G960702A	0.40		0.400000		100.0	% REC		09/15/96 1000
CCB			0.00							09/15/96 1000
MB			0.00							09/15/96 1000
LCS		G960219A	0.33		0.323000		102.2	% REC		09/15/96 1000
CCV		G960702A	0.41		0.400000		102.5	% REC		09/15/96 1000
CCB			0.00							09/15/96 1000
MD	962452-1		0.05			0.06	0.01	ABS Diff.		09/15/96 1000
MS	962452-1	G960702A	0.27		0.200000	0.06	105.0	% REC		09/15/96 1000
CCV		G960702A	0.39		0.400000		97.5	% REC		09/15/96 1000
CCB			0.00							09/15/96 1000
MD	962505-4		0.05			0.04	0.01	ABS Diff.		09/15/96 1000
MS	962505-4	G960702A	0.23		0.200000	0.04	95.0	% REC		09/15/96 1000
	962531-2		0.20			0.20	0.0	RPD		09/15/96 1000
	962531-2	G960702A	0.38		0.200000	0.20	90.0	% REC		09/15/96 1000
CCV		G960702A	0.39		0.400000		97.5	% REC		09/15/96 1000
CCB			0.00							09/15/96 1000

Test Method.....: EPA 375.2

Method Description.: Sulfate (Automated MTB, AAII)

Parameter.....: Sulfate (SO4)

Batch.....: 13276

Detection Limit....: 10.

Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICL		G951103A	49.72515		50.0		99.5	% REC		09/16/96 1100
ICB			-0.23617							09/16/96 1100
MD	962115-41		5.24234			8.53630	3.29396	ABS Diff.		09/16/96 1100
MS	962115-41	G960610A	54.73843		50.000000	8.53630	92.4	% REC		09/16/96 1100
CCV		G960415E	77.44154		80		96.8	% REC		09/16/96 1100
CCB			-0.23617							09/16/96 1100
ED	962415-1		184.3973			171.95426	7.0	RPD		09/16/96 1100
LCS		G951103A	47.16711		50.0		94.3	% REC		09/16/96 1100
CCV		G960415E	76.36214		80		95.5	% REC		09/16/96 1100
CCB			-0.23617							09/16/96 1100
MD	962115-42		1.93937			2.69514	0.75577	ABS Diff.		09/16/96 1100
MS	962115-42	G960610A	51.73226		50.000000	2.69514	98.1	% REC		09/16/96 1100
CCV		G960415E	78.61024		80		98.3	% REC		09/16/96 1100
CCB			-0.23617							09/16/96 1100
CCV		G960415E	73.93144		80		92.4	% REC		09/16/96 1100
CCB			-0.23617							09/16/96 1100
EB		10	4.67677							09/16/96 1100
ED	962376-4		26.91935			23.57898	3.34037	ABS Diff.		09/16/96 1100
CCV		G960415E	77.26167		80		96.6	% REC		09/16/96 1100
CCB			-0.23617							09/16/96 1100
CCV		G960415E	74.02151		80		92.5	% REC		09/16/96 1100
CCB			0.61561							09/16/96 1100



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Silver (Ag)

Batch.....: 13279
Detection Limit....: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960501Q	1.02007		1.00		102.0	% REC		09/16/96 1138
ICB		960729M	0.00126							09/16/96 1335
ISB		960630H	0.91673		1.000		91.7	% REC		09/16/96 1420
MB		0916	0.00286							09/16/96 1544
EB		0907	0.00254							09/16/96 1555
SB		960630G	0.92367		1.000		92.4	% REC		09/16/96 1558
MS	962377-13	960630G	0.94799		1.000	0.00114	94.7	% REC		09/16/96 1605
ED	962377-23		0.00068			0.00162	0.00094	ABS Diff.		09/16/96 1612
CCB		960729M	0.00095							09/16/96 1625
MD	962377-43		0.00316			-0.00028	0.00344	ABS Diff.		09/16/96 1633
EB		0910	0.00002							09/16/96 1639
SB		960630G	0.92600		1.000		92.6	% REC		09/16/96 1646
ED	962376-4		0.00131			0.00297	0.00166	ABS Diff.		09/16/96 1830
MD	962376-4		0.00057			0.00297	0.00240	ABS Diff.		09/16/96 1832
CCB		960729M	0.00883							09/16/96 1859
EB		0911	0.00251							09/16/96 2248
SB		960630G	1.06678		1.000		106.7	% REC		09/16/96 2251
MS	962438-1	960630G	0.96358		1.000	0.00263	96.1	% REC		09/16/96 2341
MD	962454-1		0.00126			0.00282	0.00156	ABS Diff.		09/16/96 2351
CCB		960729M	-0.00000							09/17/96 0010
MS	962468-2	960630G	0.83728		1.000	0.00337	83.4	% REC		09/17/96 0026
ED	962468-3		0.00270			0.00371	0.00101	ABS Diff.		09/17/96 0037
MS	962468-3	960630G	0.95789		1.000	0.00371	95.4	% REC		09/17/96 0039
MB		0916	0.00098							09/17/96 0051
EB		0916	0.00194							09/17/96 0053
SB		960630G	0.97207		1.000		97.2	% REC		09/17/96 0056
MS	962368-1	960630G	0.91641		1.000	0.00032	91.6	% REC		09/17/96 0103
CCB		960729M	0.00032							09/17/96 0115
ED	962299-9		-0.00385			-0.00182	0.00203	ABS Diff.		09/17/96 0128
EB		0906	0.00054							09/17/96 0132
SB		960630G	1.00985		1.000		101.0	% REC		09/17/96 0135
MS	962416-3	960630G	0.91771		1.000	0.00078	91.7	% REC		09/17/96 0145
MD	962416-3		0.00041			0.00078	0.00037	ABS Diff.		09/17/96 0154
ED	962372-1		-0.00005			-0.00128	0.00123	ABS Diff.		09/17/96 0204
CCB		960729M	-0.00065							09/17/96 0227
ISB		960630H	0.91297		1.000		91.3	% REC		09/17/96 0240
CCB		960729M	-0.00097							09/17/96 0253

Test Method.....: ASTM D 2492-90
Method Description.: Sulfur, Forms of
Parameter.....: Pyritic Sulfur

Batch.....: 13291
Detection Limit....: 0.01
Units.....: %

Analyst....: pjm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
MB			0.00							09/05/96 0900
MD	962312-1		0.19			0.21	10.0	RPD		09/05/96 0900



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: ASTM D 2492-90
Method Description.: Sulfur, Forms of
Parameter.....: Pyritic Sulfur

Batch.....: 13291
Detection Limit....: 0.3
Units.....: %

Analyst....: pjm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
MB			0.0							09/05/96 0900
MD	962312-1		6.0			6.5	8.0	RPD		09/05/96 0900

Test Method.....: EPA 325.2
Method Description.: Chloride (Colorimetric, AA II)
Parameter.....: Chloride

Batch.....: 13304
Detection Limit....: 0.5
Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICL		G960116A	50.83659		50.0		101.7	% REC		09/17/96 0930
LCS		G960116B	9.09986		10.0		91.0	% REC		09/17/96 0930
ICB			0.39646							09/17/96 0930
CCV		G960506E	80.97899		80.0		101.2	% REC		09/17/96 0930
CCB			0.39646							09/17/96 0930
MD	962453-1		2.62992			2.54949	3.1	RPD		09/17/96 0930
MS	962453-1	G960506A	53.63047		50.000000	2.54949	102.2	% REC		09/17/96 0930
S		G960116A	51.43637		50.0		102.9	% REC		09/17/96 0930
V		G960506E	84.76120		80.0		106.0	% REC		09/17/96 0930
CCB			0.39646							09/17/96 0930
MD	962455-9		0.71320			0.75285	0.03965	ABS Diff.		09/17/96 0930
MS	962455-9	G960506A	51.10902		50.000000	0.75285	100.7	% REC		09/17/96 0930
CCV		G960506E	84.16977		80.0		105.2	% REC		09/17/96 0930
CCB			0.39646							09/17/96 0930
MD	962455-8		0.59433			0.71320	0.11887	ABS Diff.		09/17/96 0930
MS	962455-8	G960506A	52.75039		50.000000	0.71320	104.1	% REC		09/17/96 0930
LCS		G960116A	51.76418		50.0		103.5	% REC		09/17/96 0930
CCV		G960506E	83.57847		80.0		104.5	% REC		09/17/96 0930
CCB			0.39646							09/17/96 0930
MD	962494-1		2.46912			2.34865	0.12047	ABS Diff.		09/17/96 0930
MS	962494-1	G960506A	54.34789		50.000000	2.34865	104.0	% REC		09/17/96 0930
EB			0.39646							09/17/96 0930
CCV		G960506E	81.33320		80.0		101.7	% REC		09/17/96 0930
CCB			0.39646							09/17/96 0930
ED	962377-22		0.39646			0.39646	0.00000	ABS Diff.		09/17/96 0930
ED	962415-1		0.39646			0.39646	0.00000	ABS Diff.		09/17/96 0930
EB			0.39646							09/17/96 0930
LCS		G960116A	52.86022		50.0		105.7	% REC		09/17/96 0930
CCV		G960506E	83.93323		80.0		104.9	% REC		09/17/96 0930
CCB			0.39646							09/17/96 0930
ED	962376-4		2.58970			2.34865	0.24105	ABS Diff.		09/17/96 0930
CCV		G960506E	81.51034		80.0		101.9	% REC		09/17/96 0930
CCB			0.39646							09/17/96 0930

Test Method.....: EPA 600 3.2.3
Method Description.: Acid Neutralization Potential
Parameter.....: Acid Neutralization Potential

Batch.....: 13329
Detection Limit....: 0.1
Units.....: t CaCO3/kt

Analyst....: dne

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
			0.0							09/16/96 1000
	962376-6		0.0			0.0	0	ABS Diff.		09/16/96 1000



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A

Batch.....: 13360

Analyst....: gag

Method Description.: Metals Analysis (ICAP)

Detection Limit....: 0.05

Parameter.....: Aluminum (Al)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960501Q	1.02187		1.00		102.2	% REC		09/12/96 1008
ICB		960729M	0.01534							09/12/96 1040
ISA		960323A	500.41424		500		100.1	% REC		09/12/96 1049
ISB		960630H	479.69213		500		95.9	% REC		09/12/96 1055
CCV		960620AA	10.17146		10.0		101.7	% REC		09/12/96 1313
CCB		960729M	0.01378							09/12/96 1324
CCV		960620AA	10.01736		10.0		100.2	% REC		09/12/96 1420
CCB		960729M	0.01535							09/12/96 1424
CCV		960620AA	9.98305		10.0		99.8	% REC		09/12/96 1524
CCB		960729M	0.01471							09/12/96 1529
CCV		960620AA	10.00139		10.0		100.0	% REC		09/12/96 1615
CCB		960729M	0.02008							09/12/96 1619
ISA		960323A	510.65856		500		102.1	% REC		09/12/96 1742
ISB		960630H	481.85311		500		96.4	% REC		09/12/96 1749
CCV		960620AA	9.93716		10.0		99.4	% REC		09/12/96 1755
CCB		960729M	0.01880							09/12/96 1759
CCV		960620AA	9.82897		10.0		98.3	% REC		09/12/96 1925
CCB		960729M	0.01630							09/12/96 193
EB		0910	0.12156							09/12/96 195
SB		960630G	2.06162		2.0000		103.1	% REC		09/12/96 2003
MS	962376-2	960630G	2.47451		2.0000	0.34195	106.6	% REC		09/12/96 2011
PDS	962376-2	960630G	2.50146		2.0000	0.34195	108.0	% REC		09/12/96 2021
CCV		960620AA	9.94194		10.0		99.4	% REC		09/12/96 2034
CCB		960729M	0.00813							09/12/96 2040
ED	962376-4		0.06603			0.10705	0.04102	ABS Diff.		09/12/96 2059
MD	962376-4		0.10770			0.10705	0.00065	ABS Diff.		09/12/96 2102
CCV		960620AA	9.78118		10.0		97.8	% REC		09/12/96 2142
CCB		960729M	0.02191							09/12/96 2147
CCV		960620AA	9.90361		10.0		99.0	% REC		09/12/96 2340
CCB		960729M	0.01699							09/12/96 2348
ISA		960323A	512.92095		500		102.6	% REC		09/12/96 2350
ISB		960630H	477.80114		500		95.6	% REC		09/12/96 2356
CCV		960620AA	10.07301		10.0		100.7	% REC		09/13/96 0016
CCB		960729M	0.02161							09/13/96 0019

Test Method.....: SW-846 6010A

Batch.....: 13360

Analyst....: gag

Method Description.: Metals Analysis (ICAP)

Detection Limit....: 0.01

Parameter.....: Barium (Ba)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960501Q	0.98827		1.00		98.8	% REC		09/12/96 1008
ICB		960729M	-0.00038							09/12/96 1040
ISB		960630H	0.49915		0.5000		99.8	% REC		09/12/96 1055
CCV		960620AA	5.02489		5.0		100.5	% REC		09/12/96 1313
CCB		960729M	-0.00030							09/12/96 1324
CCV		960620AA	4.86604		5.0		97.3	% REC		09/12/96 1420
CCB		960729M	0.00068							09/12/96 1424
CCV		960620AA	4.88005		5.0		97.6	% REC		09/12/96 1524
CCB		960729M	0.00015							09/12/96 1529
CCV		960620AA	4.90358		5.0		98.1	% REC		09/12/96 16
CCB		960729M	0.00038							09/12/96 16



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Barium (Ba)

Batch.....: 13360
Detection Limit....: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ISB		960630H	0.48904		0.5000		97.8	% REC		09/12/96 1749
CCV		960620AA	5.07454		5.0		101.5	% REC		09/12/96 1755
CCB		960729M	0.00015							09/12/96 1759
CCV		960620AA	4.99877		5.0		100.0	% REC		09/12/96 1925
CCB		960729M	-0.00038							09/12/96 1937
EB		0910	0.39087							09/12/96 1959
SB		960630G	1.06923		1.000		106.9	% REC		09/12/96 2005
MS	962376-2	960630G	1.38556		1.000	0.37740	100.8	% REC		09/12/96 2011
PDS	962376-2	960630G	1.44450		1.000	0.37740	106.7	% REC		09/12/96 2021
CCV		960620AA	5.04202		5.0		100.8	% REC		09/12/96 2034
CCB		960729M	0.00030							09/12/96 2040
ED	962376-4		0.20324			0.24162	17.3	RPD		09/12/96 2059
MD	962376-4		0.27368			0.24162	12.4	RPD		09/12/96 2102
CCV		960620AA	4.89124		5.0		97.8	% REC		09/12/96 2142
CCB		960729M	0.00015							09/12/96 2147
CCV		960620AA	4.99542		5.0		99.9	% REC		09/12/96 2340
CCB		960729M	-0.00030							09/12/96 2348
I		960630H	0.48033		0.5000		96.1	% REC		09/12/96 2356
I		960620AA	5.10165		5.0		102.0	% REC		09/13/96 0016
CCB		960729M	0.00144							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Boron (B)

Batch.....: 13360
Detection Limit....: 0.05
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960501Q	0.98904		1.00		98.9	% REC		09/12/96 1008
ICB		960729M	0.00127							09/12/96 1040
ISB		960630H	0.80383		1.000		80.4	% REC		09/12/96 1055
CCV		960620AA	2.58566		2.5		103.4	% REC		09/12/96 1313
CCB		960729M	0.00798							09/12/96 1324
CCV		960620AA	2.53163		2.5		101.3	% REC		09/12/96 1420
CCB		960729M	0.00665							09/12/96 1424
CCV		960620AA	2.54492		2.5		101.8	% REC		09/12/96 1524
CCB		960729M	0.01064							09/12/96 1529
CCV		960620AA	2.54605		2.5		101.8	% REC		09/12/96 1615
CCB		960729M	0.00797							09/12/96 1619
ISB		960630H	0.99672		1.000		99.7	% REC		09/12/96 1749
CCV		960620AA	2.54841		2.5		101.9	% REC		09/12/96 1755
CCB		960729M	0.00799							09/12/96 1759
CCV		960620AA	2.50598		2.5		100.2	% REC		09/12/96 1925
CCB		960729M	-0.00133							09/12/96 1937
EB		0910	0.25017							09/12/96 1959
SB		960630G	1.08191		1.000		108.2	% REC		09/12/96 2005
MS	962376-2	960630G	1.33796		1.000	0.24512	109.3	% REC		09/12/96 2011
PDS	962376-2	960630G	1.34369		1.000	0.24512	109.9	% REC		09/12/96 2021
CCV		960620AA	2.51451		2.5		100.6	% REC		09/12/96 2034
CCB		960729M	0.00134							09/12/96 2040
ED	962376-4		0.16502			0.19691	0.03189	ABS Diff.		09/12/96 2059
	962376-4		0.22082			0.19691	0.02391	ABS Diff.		09/12/96 2102
V		960620AA	2.48554		2.5		99.4	% REC		09/12/96 2142



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
 Method Description.: Metals Analysis (ICAP)
 Parameter.....: Boron (B)

Batch.....: 13360
 Detection Limit....: 0.05
 Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
CCB		960729M	0.01066							09/12/96 2147
CCV		960620AA	2.48446		2.5		99.4	% REC		09/12/96 2340
CCB		960729M	0.00134							09/12/96 2348
ISB		960630H	0.98825		1.000		98.8	% REC		09/12/96 2356
CCV		960620AA	2.55838		2.5		102.3	% REC		09/13/96 0016
CCB		960729M	0.01332							09/13/96 0019

Test Method.....: SW-846 6010A
 Method Description.: Metals Analysis (ICAP)
 Parameter.....: Cadmium (Cd)

Batch.....: 13360
 Detection Limit....: 0.005
 Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	2.02373		2.00		101.2	% REC		09/12/96 1005
ICB		960729M	-0.00060							09/12/96 1040
ISB		960630H	1.01845		1.000		101.8	% REC		09/12/96 1055
CCV		960620AA	2.48877		2.5		99.6	% REC		09/12/96 131
CCB		960729M	-0.00245							09/12/96 132
CCV		960620AA	2.47685		2.5		99.1	% REC		09/12/96 142
CCB		960729M	-0.00061							09/12/96 1424
CCV		960620AA	2.45725		2.5		98.3	% REC		09/12/96 1524
CCB		960729M	-0.00244							09/12/96 1529
CCV		960620AA	2.43648		2.5		97.5	% REC		09/12/96 1615
CCB		960729M	-0.00061							09/12/96 1619
ISB		960630H	0.94170		1.000		94.2	% REC		09/12/96 1749
CCV		960620AA	2.26499		2.5		90.6	% REC		09/12/96 1755
CCB		960729M	-0.00061							09/12/96 1759
CCV		960620AA	2.37951		2.5		95.2	% REC		09/12/96 1925
CCB		960729M	-0.00258							09/12/96 1937
EB		0910	-0.00324							09/12/96 1959
SB		960630G	1.06320		1.000		106.3	% REC		09/12/96 2005
MS	962376-2	960630G	1.05509		1.000	-0.00196	105.7	% REC		09/12/96 2011
PDS	962376-2	960630G	1.09063		1.000	-0.00196	109.3	% REC		09/12/96 2021
CCV		960620AA	2.40158		2.5		96.1	% REC		09/12/96 2034
CCB		960729M	-0.00064							09/12/96 2040
ED	962376-4		-0.00196			-0.00196	0.00000	ABS Diff.		09/12/96 2059
MD	962376-4		-0.00391			-0.00196	0.00195	ABS Diff.		09/12/96 2102
CCV		960620AA	2.39919		2.5		96.0	% REC		09/12/96 2142
CCB		960729M	-0.00196							09/12/96 2147
CCV		960620AA	2.35227		2.5		94.1	% REC		09/12/96 2340
CCB		960729M	-0.00196							09/12/96 2348
ISB		960630H	0.98890		1.000		98.9	% REC		09/12/96 2356
CCV		960620AA	2.38980		2.5		95.6	% REC		09/13/96 0016
CCB		960729M	0.00130							09/13/96 0019



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Calcium (Ca)

Batch.....: 13360
Detection Limit....: 0.1
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960412S	20.18804		20.000000		100.9	% REC		09/12/96 1019
ICB		960729M	-0.01151							09/12/96 1040
CCV		960620AA	10.23494		10.0		102.3	% REC		09/12/96 1313
CCB		960729M	-0.01127							09/12/96 1324
CCV		960620AA	10.64571		10.0		106.5	% REC		09/12/96 1420
CCB		960729M	0.00346							09/12/96 1424
CCV		960620AA	10.07961		10.0		100.8	% REC		09/12/96 1524
CCB		960729M	-0.00027							09/12/96 1529
CCV		960620AA	10.16854		10.0		101.7	% REC		09/12/96 1615
CCB		960729M	0.00047							09/12/96 1619
CCV		960620AA	10.41598		10.0		104.2	% REC		09/12/96 1755
CCB		960729M	0.00218							09/12/96 1759
CCV		960620AA	10.15337		10.0		101.5	% REC		09/12/96 1925
CCB		960729M	-0.01023							09/12/96 1937
EB		0910	0.14067							09/12/96 1959
SB		960630G	47.51145		50.000		95.0	% REC		09/12/96 2005
MS	962376-2	960630G	59.40200		50.000	13.82147	91.2	% REC		09/12/96 2011
		960620AA	10.12768		10.0		101.3	% REC		09/12/96 2034
		960729M	-0.00869							09/12/96 2040
CCV		960620AA	10.01581		10.0		100.2	% REC		09/12/96 2142
CCB		960729M	-0.00380							09/12/96 2147
CCV		960620AA	10.13159		10.0		101.3	% REC		09/12/96 2340
CCB		960729M	-0.00825							09/12/96 2348
CCV		960620AA	10.42251		10.0		104.2	% REC		09/13/96 0016
CCB		960729M	0.00679							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Calcium (Ca)

Batch.....: 13360
Detection Limit....: 1
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960412S	194.27105		200		97.1	% REC		09/12/96 1012
ICB		960729M	-0.43043							09/12/96 1040
ISA		960323A	504.42315		500		100.9	% REC		09/12/96 1049
ISB		960630H	491.92553		500		98.4	% REC		09/12/96 1055
CCV		960620BB	263.91876		250.00		105.6	% REC		09/12/96 1304
CCB		960729M	-0.16327							09/12/96 1324
CCV		960620BB	269.36608		250.00		107.7	% REC		09/12/96 1418
CCB		960729M	0.70503							09/12/96 1424
CCV		960620BB	264.71286		250.00		105.9	% REC		09/12/96 1522
CCB		960729M	0.14842							09/12/96 1529
CCV		960620BB	263.15435		250.00		105.3	% REC		09/12/96 1612
CCB		960729M	-0.00742							09/12/96 1619
ISA		960323A	514.10803		500		102.8	% REC		09/12/96 1742
ISB		960630H	494.17425		500		98.8	% REC		09/12/96 1749
CCV		960620BB	269.70001		250.00		107.9	% REC		09/12/96 1752
CCB		960729M	0.29562							09/12/96 1759
CCV		960620BB	264.67974		250.00		105.9	% REC		09/12/96 1922
CCB		960729M	0.19221							09/12/96 1937
		0910	0.96846							09/12/96 1959
		960620BB	261.27777		250.00		104.5	% REC		09/12/96 2027



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A

Batch.....: 13360

Analyst....: gag

Method Description.: Metals Analysis (ICAP)

Detection Limit....: 1

Parameter.....: Calcium (Ca)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
CCB		960729M	0.08132							09/12/96 2040
ED	962376-4		42.61233			26.95429	45.0	RPD	*	09/12/96 2059
MD	962376-4		27.18347			26.95429	0.8	RPD		09/12/96 2102
CCV		960620BB	259.57000		250.00		103.8	% REC		09/12/96 2139
CCB		960729M	0.74667							09/12/96 2147
CCV		960620BB	260.07275		250.00		104.0	% REC		09/12/96 2337
CCB		960729M	-0.06653							09/12/96 2348
ISA		960323A	518.34906		500		103.7	% REC		09/12/96 2350
ISB		960630H	492.08227		500		98.4	% REC		09/12/96 2356
CCV		960620BB	263.44390		250.00		105.4	% REC		09/13/96 0013
CCB		960729M	-0.34007							09/13/96 0019

Test Method.....: SW-846 6010A

Batch.....: 13360

Analyst....: gag

Method Description.: Metals Analysis (ICAP)

Detection Limit....: 0.01

Parameter.....: Chromium (Cr)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	1.96694		2.00		98.3	% REC		09/12/96 1005
ICB		960729M	-0.00080							09/12/96 1040
ISB		960630H	0.45888		0.5000		91.8	% REC		09/12/96 1055
CCV		960620AA	2.52961		2.5		101.2	% REC		09/12/96 1313
CCB		960729M	0.00040							09/12/96 1324
CCV		960620AA	2.47470		2.5		99.0	% REC		09/12/96 1420
CCB		960729M	-0.00159							09/12/96 1424
CCV		960620AA	2.46826		2.5		98.7	% REC		09/12/96 1524
CCB		960729M	-0.00079							09/12/96 1529
CCV		960620AA	2.45742		2.5		98.3	% REC		09/12/96 1615
CCB		960729M	0.00040							09/12/96 1619
ISB		960630H	0.43362		0.5000		86.7	% REC		09/12/96 1749
CCV		960620AA	2.43656		2.5		97.5	% REC		09/12/96 1755
CCB		960729M	-0.00039							09/12/96 1759
CCV		960620AA	2.38801		2.5		95.5	% REC		09/12/96 1925
CCB		960729M	0.00000							09/12/96 1937
EB		0910	0.00000							09/12/96 1959
SB		960630G	0.94183		1.000		94.2	% REC		09/12/96 2005
MS	962376-2	960630G	0.97613		1.000	-0.00208	97.8	% REC		09/12/96 2011
PDS	962376-2	960630G	1.02405		1.000	-0.00208	102.6	% REC		09/12/96 2021
CCV		960620AA	2.41248		2.5		96.5	% REC		09/12/96 2034
CCB		960729M	0.00120							09/12/96 2040
ED	962376-4		0.00574			0.00022	0.00552	ABS	Diff.	09/12/96 2059
MD	962376-4		0.00023			0.00022	0.00001	ABS	Diff.	09/12/96 2102
CCV		960620AA	2.37439		2.5		95.0	% REC		09/12/96 2142
CCB		960729M	-0.00079							09/12/96 2147
CCV		960620AA	2.37596		2.5		95.0	% REC		09/12/96 2340
CCB		960729M	0.00040							09/12/96 2348
ISB		960630H	0.42937		0.5000		85.9	% REC		09/12/96 2356
CCV		960620AA	2.41768		2.5		96.7	% REC		09/13/96 0016
CCB		960729M	-0.00040							09/13/96 0019



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Cobalt (Co)

Batch.....: 13360
Detection Limit...: 0.03
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	2.01097		2.00		100.5	% REC		09/12/96 1005
ICB		960729M	0.00033							09/12/96 1040
ISB		960630H	0.49250		0.5000		98.5	% REC		09/12/96 1055
CCV		960620AA	2.54521		2.5		101.8	% REC		09/12/96 1313
CCB		960729M	0.00000							09/12/96 1324
CCV		960620AA	2.48799		2.5		99.5	% REC		09/12/96 1420
CCB		960729M	0.00000							09/12/96 1424
CCV		960620AA	2.48234		2.5		99.3	% REC		09/12/96 1524
CCB		960729M	0.00033							09/12/96 1529
CCV		960620AA	2.46579		2.5		98.6	% REC		09/12/96 1615
CCB		960729M	0.00164							09/12/96 1619
ISB		960630H	0.46420		0.5000		92.8	% REC		09/12/96 1749
CCV		960620AA	2.42470		2.5		97.0	% REC		09/12/96 1755
CCB		960729M	0.00165							09/12/96 1759
CCV		960620AA	2.37430		2.5		95.0	% REC		09/12/96 1925
CCB		960729M	0.00165							09/12/96 1937
ED		0910	0.00208							09/12/96 1959
		960630G	0.96035		1.000		96.0	% REC		09/12/96 2005
	962376-2	960630G	0.99504		1.000	0.00141	99.4	% REC		09/12/96 2011
	962376-2	960630G	1.04809		1.000	0.00141	104.7	% REC		09/12/96 2021
		960620AA	2.39672		2.5		95.9	% REC		09/12/96 2034
		960729M	-0.00065							09/12/96 2040
ED	962376-4		0.00120			-0.00014	0.00134	ABS Diff.		09/12/96 2059
MD	962376-4		0.00115			-0.00014	0.00129	ABS Diff.		09/12/96 2102
CCV		960620AA	2.35695		2.5		94.3	% REC		09/12/96 2142
CCB		960729M	-0.00031							09/12/96 2147
CCV		960620AA	2.36410		2.5		94.6	% REC		09/12/96 2340
CCB		960729M	0.00364							09/12/96 2348
ISB		960630H	0.45598		0.5000		91.2	% REC		09/12/96 2356
CCV		960620AA	2.39793		2.5		95.9	% REC		09/13/96 0016
CCB		960729M	0.00099							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Copper (Cu)

Batch.....: 13360
Detection Limit...: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	1.97975		2.00		99.0	% REC		09/12/96 1005
ICB		960729M	-0.00187							09/12/96 1040
ISB		960630H	0.46466		0.5000		92.9	% REC		09/12/96 1055
CCV		960620AA	2.46514		2.5		98.6	% REC		09/12/96 1313
CCB		960729M	-0.00265							09/12/96 1324
CCV		960620AA	2.39043		2.5		95.6	% REC		09/12/96 1420
CCB		960729M	-0.00308							09/12/96 1424
CCV		960620AA	2.38899		2.5		95.6	% REC		09/12/96 1524
CCB		960729M	-0.00267							09/12/96 1529
CCV		960620AA	2.39662		2.5		95.9	% REC		09/12/96 1615
CCB		960729M	-0.00152							09/12/96 1619
ISB		960630H	0.44975		0.5000		90.0	% REC		09/12/96 1749
V		960620AA	2.43289		2.5		97.3	% REC		09/12/96 1755
B		960729M	-0.00001							09/12/96 1759



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A

Batch.....: 13360

Analyst....: gag

Method Description.: Metals Analysis (ICAP)

Detection Limit....: 0.01

Parameter.....: Copper (Cu)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
CCV		960620AA	2.39706		2.5		95.9	% REC		09/12/96 1925
CCB		960729M	0.00074							09/12/96 1937
EB		0910	-0.00157							09/12/96 1959
SB		960630G	0.92091		1.000		92.1	% REC		09/12/96 2005
MS	962376-2	960630G	0.97499		1.000	0.00332	97.2	% REC		09/12/96 2011
PDS	962376-2	960630G	1.04293		1.000	0.00332	104.0	% REC		09/12/96 2021
CCV		960620AA	2.41868		2.5		96.7	% REC		09/12/96 2034
CCB		960729M	0.00075							09/12/96 2040
ED	962376-4		-0.00437			-0.00193	0.00244	ABS Diff.		09/12/96 2059
MD	962376-4		-0.00232			-0.00193	0.00039	ABS Diff.		09/12/96 2102
CCV		960620AA	2.36424		2.5		94.6	% REC		09/12/96 2142
CCB		960729M	0.00452							09/12/96 2147
CCV		960620AA	2.40805		2.5		96.3	% REC		09/12/96 2340
CCB		960729M	0.00076							09/12/96 2348
ISB		960630H	0.44352		0.5000		88.7	% REC		09/12/96 2356
CCV		960620AA	2.45639		2.5		98.3	% REC		09/13/96 0016
CCB		960729M	0.00154							09/13/96 0019

Test Method.....: SW-846 6010A

Batch.....: 13360

Analyst....: gag

Method Description.: Metals Analysis (ICAP)

Detection Limit....: 0.03

Parameter.....: Iron (Fe)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	1.99681		2.00		99.8	% REC		09/12/96 1005
ICB		960729M	0.00235							09/12/96 1040
ISA		960323A	173.47692		200		86.7	% REC		09/12/96 1049
ISB		960630H	171.57672		200		85.8	% REC		09/12/96 1055
CCV		960620AA	10.15374		10.0		101.5	% REC		09/12/96 1313
CCB		960729M	0.00117							09/12/96 1324
CCV		960620AA	9.89694		10.0		99.0	% REC		09/12/96 1420
CCB		960729M	0.00195							09/12/96 1424
CCV		960620AA	9.89703		10.0		99.0	% REC		09/12/96 1524
CCB		960729M	0.00275							09/12/96 1529
CCV		960620AA	9.83694		10.0		98.4	% REC		09/12/96 1615
CCB		960729M	0.00195							09/12/96 1619
ISA		960323A	176.81828		200		88.4	% REC		09/12/96 1742
ISB		960630H	167.51077		200		83.8	% REC		09/12/96 1749
CCV		960620AA	9.89318		10.0		98.9	% REC		09/12/96 1755
CCB		960729M	0.00394							09/12/96 1759
CCV		960620AA	9.63694		10.0		96.4	% REC		09/12/96 1925
CCB		960729M	0.00078							09/12/96 1937
EB		0910	0.04740							09/12/96 1959
SB		960630G	1.94594		2.0000		97.3	% REC		09/12/96 2005
MS	962376-2	960630G	2.11719		2.0000	0.09910	100.9	% REC		09/12/96 2011
PDS	962376-2	960630G	2.22166		2.0000	0.09910	106.1	% REC		09/12/96 2021
CCV		960620AA	9.75281		10.0		97.5	% REC		09/12/96 2034
CCB		960729M	0.00197							09/12/96 2040
ED	962376-4		0.03388			0.02994	0.00394	ABS Diff.		09/12/96 2059
MD	962376-4		0.02717			0.02994	0.00277	ABS Diff.		09/12/96 2102
CCV		960620AA	9.53408		10.0		95.3	% REC		09/12/96 214
CCB		960729M	0.00472							09/12/96 214



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Iron (Fe)

Batch.....: 13360
Detection Limit....: 0.03
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
CCV		960620AA	9.58829		10.0		95.9	% REC		09/12/96 2340
CCB		960729M	0.00513							09/12/96 2348
ISA		960323A	175.81068		200		87.9	% REC		09/12/96 2350
ISB		960630H	164.04003		200		82.0	% REC		09/12/96 2356
CCV		960620AA	9.75918		10.0		97.6	% REC		09/13/96 0016
CCB		960729M	0.00671							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Magnesium (Mg)

Batch.....: 13360
Detection Limit....: 0.1
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960412S	20.85509		20.000000		104.3	% REC		09/12/96 1019
ICB		960729M	-0.01918							09/12/96 1040
CCV		960620AA	26.14344		25.0		104.6	% REC		09/12/96 1313
		960729M	-0.02211							09/12/96 1324
		960620AA	26.32280		25.0		105.3	% REC		09/12/96 1420
CCB		960729M	-0.00453							09/12/96 1424
CCV		960620AA	25.66957		25.0		102.7	% REC		09/12/96 1524
CCB		960729M	-0.01054							09/12/96 1529
CCV		960620AA	25.57904		25.0		102.3	% REC		09/12/96 1615
CCB		960729M	-0.01098							09/12/96 1619
CCV		960620AA	25.35166		25.0		101.4	% REC		09/12/96 1755
CCB		960729M	-0.00981							09/12/96 1759
CCV		960620AA	24.82343		25.0		99.3	% REC		09/12/96 1925
CCB		960729M	-0.02372							09/12/96 1937
EB		0910	-0.01332							09/12/96 1959
SB		960630G	50.63048		50.000		101.3	% REC		09/12/96 2005
MS	962376-2	960630G	50.68201		50.000	0.58829	100.2	% REC		09/12/96 2011
CCV		960620AA	25.13531		25.0		100.5	% REC		09/12/96 2034
CCB		960729M	-0.02211							09/12/96 2040
ED	962376-4		0.92941			0.71466	26.1	RPD *		09/12/96 2059
MD	962376-4		0.71144			0.71466	0.5	RPD		09/12/96 2102
CCV		960620AA	24.72323		25.0		98.9	% REC		09/12/96 2142
CCB		960729M	-0.01860							09/12/96 2147
CCV		960620AA	24.79984		25.0		99.2	% REC		09/12/96 2340
CCB		960729M	-0.02387							09/12/96 2348
CCV		960620AA	25.19843		25.0		100.8	% REC		09/13/96 0016
CCB		960729M	-0.00439							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Magnesium (Mg)

Batch.....: 13360
Detection Limit....: 0.5
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960412S	195.01724		200		97.5	% REC		09/12/96 1012
ICB		960729M	0.07704							09/12/96 1040
A		960323A	527.57885		500		105.5	% REC		09/12/96 1049
B		960630H	507.32421		500		101.5	% REC		09/12/96 1055



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
 Method Description.: Metals Analysis (ICAP)
 Parameter.....: Magnesium (Mg)

Batch.....: 13360
 Detection Limit....: 0.5
 Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
CCV		960620BB	247.97729		250.00		99.2	% REC		09/12/96 1304
CCB		960729M	0.10657							09/12/96 1324
CCV		960620BB	253.25859		250.00		101.3	% REC		09/12/96 1418
CCB		960729M	0.20159							09/12/96 1424
CCV		960620BB	248.82028		250.00		99.5	% REC		09/12/96 1522
CCB		960729M	0.14317							09/12/96 1529
CCV		960620BB	248.38497		250.00		99.4	% REC		09/12/96 1612
CCB		960729M	0.13803							09/12/96 1619
ISA		960323A	538.18255		500		107.6	% REC		09/12/96 1742
ISB		960630H	511.09228		500		102.2	% REC		09/12/96 1749
CCV		960620BB	253.41204		250.00		101.4	% REC		09/12/96 1752
CCB		960729M	-0.01605							09/12/96 1759
CCV		960620BB	247.60299		250.00		99.0	% REC		09/12/96 1922
CCB		960729M	-0.03402							09/12/96 1937
EB		0910	0.02632							09/12/96 1959
MS	962376-2	960630G	54.38150		50	0.80638	107.2	% REC		09/12/96 2011
CCV		960620BB	243.60122		250.00		97.4	% REC		09/12/96 2027
CCB		960729M	-0.04750							09/12/96 204
ED	962376-4		1.40090			1.01054	0.39036	ABS Diff.		09/12/96 205
MD	962376-4		1.00926			1.01054	0.00128	ABS Diff.		09/12/96 210
CCV		960620BB	242.89117		250.00		97.2	% REC		09/12/96 2139
CCB		960729M	0.01926							09/12/96 2147
CCV		960620BB	244.17584		250.00		97.7	% REC		09/12/96 2337
CCB		960729M	-0.05970							09/12/96 2348
ISA		960323A	544.72607		500		108.9	% REC		09/12/96 2350
ISB		960630H	510.12088		500		102.0	% REC		09/12/96 2356
CCV		960620BB	246.97573		250.00		98.8	% REC		09/13/96 0013
CCB		960729M	-0.05072							09/13/96 0019

Test Method.....: SW-846 6010A
 Method Description.: Metals Analysis (ICAP)
 Parameter.....: Manganese (Mn)

Batch.....: 13360
 Detection Limit....: 0.01
 Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	2.02425		2.00		101.2	% REC		09/12/96 1005
ICB		960729M	0.00100							09/12/96 1040
ISB		960630H	0.45677		0.5000		91.4	% REC		09/12/96 1055
CCV		960620AA	5.11136		5.0		102.2	% REC		09/12/96 1313
CCB		960729M	0.00075							09/12/96 1324
CCV		960620AA	5.02988		5.0		100.6	% REC		09/12/96 1420
CCB		960729M	0.00252							09/12/96 1424
CCV		960620AA	5.03090		5.0		100.6	% REC		09/12/96 1524
CCB		960729M	0.00201							09/12/96 1529
CCV		960620AA	5.00644		5.0		100.1	% REC		09/12/96 1615
CCB		960729M	0.00201							09/12/96 1619
ISB		960630H	0.43207		0.5000		86.4	% REC		09/12/96 1749
CCV		960620AA	4.92655		5.0		98.5	% REC		09/12/96 1755
CCB		960729M	0.00126							09/12/96 1759
CCV		960620AA	4.81916		5.0		96.4	% REC		09/12/96 1925
CCB		960729M	0.00126							09/12/96 193
EB		0910	0.00180							09/12/96 195



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLO 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Manganese (Mn)

Batch.....: 13360
Detection Limit....: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
SB		960630G	0.98244		1.000		98.2	% REC		09/12/96 2005
MS	962376-2	960630G	1.14870		1.000	0.13346	101.5	% REC		09/12/96 2011
PDS	962376-2	960630G	1.19703		1.000	0.13346	106.4	% REC		09/12/96 2021
CCV		960620AA	4.89505		5.0		97.9	% REC		09/12/96 2034
CCB		960729M	0.00126							09/12/96 2040
ED	962376-4		0.13001			0.08987	36.5	RPD *		09/12/96 2059
MD	962376-4		0.08886			0.08987	1.1	RPD		09/12/96 2102
CCV		960620AA	4.79067		5.0		95.8	% REC		09/12/96 2142
CCB		960729M	0.00127							09/12/96 2147
CCV		960620AA	4.79270		5.0		95.9	% REC		09/12/96 2340
CCB		960729M	0.00101							09/12/96 2348
ISB		960630H	0.42295		0.5000		84.6	% REC		09/12/96 2356
CCV		960620AA	4.87893		5.0		97.6	% REC		09/13/96 0016
CCB		960729M	0.00176							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Molybdenum (Mo)

Batch.....: 13360
Detection Limit....: 0.05
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	2.02394		2.00		101.2	% REC		09/12/96 1005
ICB		960729M	0.00240							09/12/96 1040
ISB		960630H	0.96782		1.000		96.8	% REC		09/12/96 1055
CCV		960620AA	2.53536		2.5		101.4	% REC		09/12/96 1313
CCB		960729M	-0.00080							09/12/96 1324
CCV		960620AA	2.47606		2.5		99.0	% REC		09/12/96 1420
CCB		960729M	0.00000							09/12/96 1424
CCV		960620AA	2.46407		2.5		98.6	% REC		09/12/96 1524
CCB		960729M	0.00160							09/12/96 1529
CCV		960620AA	2.44406		2.5		97.8	% REC		09/12/96 1615
CCB		960729M	0.00000							09/12/96 1619
ISB		960630H	0.92193		1.000		92.2	% REC		09/12/96 1749
CCV		960620AA	2.44004		2.5		97.6	% REC		09/12/96 1755
CCB		960729M	0.00239							09/12/96 1759
CCV		960620AA	2.37997		2.5		95.2	% REC		09/12/96 1925
CCB		960729M	0.00160							09/12/96 1937
EB		0910	0.00160							09/12/96 1959
SB		960630G	0.95050		1.000		95.0	% REC		09/12/96 2005
MS	962376-2	960630G	0.99695		1.000	0.00640	99.1	% REC		09/12/96 2011
PDS	962376-2	960630G	1.05220		1.000	0.00640	104.6	% REC		09/12/96 2021
CCV		960620AA	2.40239		2.5		96.1	% REC		09/12/96 2034
CCB		960729M	-0.00080							09/12/96 2040
ED	962376-4		0.00319			0.00480	0.00161	ABS Diff.		09/12/96 2059
MD	962376-4		0.00639			0.00480	0.00159	ABS Diff.		09/12/96 2102
CCV		960620AA	2.33992		2.5		93.6	% REC		09/12/96 2142
CCB		960729M	0.00079							09/12/96 2147
CCV		960620AA	2.33913		2.5		93.6	% REC		09/12/96 2340
CCB		960729M	-0.00160							09/12/96 2348
ISB		960630H	0.90441		1.000		90.4	% REC		09/12/96 2356
V		960620AA	2.38880		2.5		95.6	% REC		09/13/96 0016
B		960729M	0.00240							09/13/96 0019



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Nickel (Ni)

Batch.....: 13360
Detection Limit....: 0.04
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	2.04075		2.00		102.0	% REC		09/12/96 1005
ICB		960729M	0.00118							09/12/96 1040
ISB		960630H	0.96225		1.000		96.2	% REC		09/12/96 1055
CCV		960620AA	2.57292		2.5		102.9	% REC		09/12/96 1313
CCB		960729M	0.00048							09/12/96 1324
CCV		960620AA	2.49869		2.5		99.9	% REC		09/12/96 1420
CCB		960729M	0.00049							09/12/96 1424
CCV		960620AA	2.51785		2.5		100.7	% REC		09/12/96 1524
CCB		960729M	-0.00067							09/12/96 1529
CCV		960620AA	2.51993		2.5		100.8	% REC		09/12/96 1615
CCB		960729M	0.00482							09/12/96 1619
ISB		960630H	0.89302		1.000		89.3	% REC		09/12/96 1749
CCV		960620AA	2.43463		2.5		97.4	% REC		09/12/96 1755
CCB		960729M	-0.00250							09/12/96 1759
CCV		960620AA	2.41964		2.5		96.8	% REC		09/12/96 1925
CCB		960729M	0.00300							09/12/96 1937
EB		0910	-0.00386							09/12/96 1950
SB		960630G	0.94660		1.000		94.7	% REC		09/12/96 200
MS	962376-2	960630G	1.01140		1.000	0.00372	100.8	% REC		09/12/96 201
PDS	962376-2	960630G	1.06066		1.000	0.00372	105.7	% REC		09/12/96 2021
CCV		960620AA	2.40817		2.5		96.3	% REC		09/12/96 2034
CCB		960729M	-0.00180							09/12/96 2040
ED	962376-4		-0.00176			0.00071	0.00247	ABS Diff.		09/12/96 2059
MD	962376-4		-0.00247			0.00071	0.00318	ABS Diff.		09/12/96 2102
CCV		960620AA	2.37545		2.5		95.0	% REC		09/12/96 2142
CCB		960729M	-0.00845							09/12/96 2147
CCV		960620AA	2.38077		2.5		95.2	% REC		09/12/96 2340
CCB		960729M	-0.00618							09/12/96 2348
ISB		960630H	0.89965		1.000		90.0	% REC		09/12/96 2356
CCV		960620AA	2.43961		2.5		97.6	% REC		09/13/96 0016
CCB		960729M	-0.00110							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Potassium (K)

Batch.....: 13360
Detection Limit....: 5
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960412S	101.36154		100.0		101.4	% REC		09/12/96 1012
ICB		960729M	-0.66377							09/12/96 1040
ISB		960630H	11.46436		10.000		114.6	% REC		09/12/96 1055
CCV		960620BB	242.75866		250.00		97.1	% REC		09/12/96 1304
CCB		960729M	-0.37772							09/12/96 1324
CCV		960620BB	246.74252		250.00		98.7	% REC		09/12/96 1418
CCB		960729M	1.13994							09/12/96 1424
CCV		960620BB	239.80152		250.00		95.9	% REC		09/12/96 1522
CCB		960729M	-0.09911							09/12/96 1529
CCV		960620BB	238.70954		250.00		95.5	% REC		09/12/96 1612
CCB		960729M	-0.15815							09/12/96 1619
ISB		960630H	8.34719		10.000		83.5	% REC		09/12/96 1749
CCV		960620BB	243.23074		250.00		97.3	% REC		09/12/96 175
CCB		960729M	-3.01784							09/12/96 175



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Potassium (K)

Batch.....: 13360
Detection Limit...: 5
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
CCV		960620BB	236.21444		250.00		94.5	% REC		09/12/96 1922
CCB		960729M	-2.84940							09/12/96 1937
EB		0910	-1.58606							09/12/96 1959
SB		960630G	53.35316		50.000		106.7	% REC		09/12/96 2005
MS	962376-2	960630G	52.12557		50.000	0.78726	102.7	% REC		09/12/96 2011
CCV		960620BB	232.75604		250.00		93.1	% REC		09/12/96 2027
CCB		960729M	-3.12239							09/12/96 2040
ED	962376-4		-1.32275			-1.64673	0.32398	ABS Diff.		09/12/96 2059
MD	962376-4		-1.40664			-1.64673	0.24009	ABS Diff.		09/12/96 2102
CCV		960620BB	231.19332		250.00		92.5	% REC		09/12/96 2139
CCB		960729M	-1.69723							09/12/96 2147
CCV		960620BB	231.28738		250.00		92.5	% REC		09/12/96 2337
CCB		960729M	-3.50269							09/12/96 2348
ISB		960630H	9.31669		10.000		93.2	% REC		09/12/96 2356
CCV		960620BB	235.41511		250.00		94.2	% REC		09/13/96 0013
CCB		960729M	-3.16319							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Sodium (Na)

Batch.....: 13360
Detection Limit...: 1
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960412S	20.56211		20.000000		102.8	% REC		09/12/96 1019
ICB		960729M	0.01135							09/12/96 1040
CCV		960620AA	50.49625		50.0		101.0	% REC		09/12/96 1313
CCB		960729M	0.00908							09/12/96 1324
CCV		960620AA	50.28049		50.0		100.6	% REC		09/12/96 1420
CCB		960729M	0.07608							09/12/96 1424
CCV		960620AA	49.00862		50.0		98.0	% REC		09/12/96 1524
CCB		960729M	0.03406							09/12/96 1529
CCV		960620AA	49.32432		50.0		98.6	% REC		09/12/96 1615
CCB		960729M	0.02498							09/12/96 1619
CCV		960620AA	50.43379		50.0		100.9	% REC		09/12/96 1755
CCB		960729M	0.01135							09/12/96 1759
CCV		960620AA	49.93755		50.0		99.9	% REC		09/12/96 1925
CCB		960729M	-0.01021							09/12/96 1937
EB		0910	1.65088							09/12/96 1959
SB		960630G	52.81013		50.000		105.6	% REC		09/12/96 2005
MS	962376-2	960630G	60.37990		50.000	7.83432	105.1	% REC		09/12/96 2011
CCV		960620AA	50.18847		50.0		100.4	% REC		09/12/96 2034
CCB		960729M	-0.01135							09/12/96 2040
ED	962376-4		22.08483			21.44900	2.9	RPD		09/12/96 2059
MD	962376-4		21.48761			21.44900	0.2	RPD		09/12/96 2102
CCV		960620AA	48.74082		50.0		97.5	% REC		09/12/96 2142
CCB		960729M	0.02724							09/12/96 2147
CCV		960620AA	49.39028		50.0		98.8	% REC		09/12/96 2340
CCB		960729M	-0.01135							09/12/96 2348
CCV		960620AA	50.39512		50.0		100.8	% REC		09/13/96 0016
CCB		960729M	0.01589							09/13/96 0019



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A

Batch.....: 13360

Analyst....: gag

Method Description.: Metals Analysis (ICAP)

Detection Limit....: 5

Parameter.....: Sodium (Na)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960412S	209.51296		200		104.8	% REC		09/12/96 1012
ICB		960729M	-1.12803							09/12/96 1040
ISA		960323A	515.81933		500		103.2	% REC		09/12/96 1049
ISB		960630H	503.23678		500		100.6	% REC		09/12/96 1055
CCV		960620BB	493.21362		500.0		98.6	% REC		09/12/96 1304
CCB		960729M	0.41855							09/12/96 1324
CCV		960620BB	503.71832		500.0		100.7	% REC		09/12/96 1418
CCB		960729M	2.88405							09/12/96 1424
CCV		960620BB	491.50311		500.0		98.3	% REC		09/12/96 1522
CCB		960729M	0.88817							09/12/96 1529
CCV		960620BB	488.66531		500.0		97.7	% REC		09/12/96 1612
CCB		960729M	0.89840							09/12/96 1619
ISA		960323A	521.46118		500		104.3	% REC		09/12/96 1742
ISB		960630H	497.50476		500		99.5	% REC		09/12/96 1749
CCV		960620BB	497.90319		500.0		99.6	% REC		09/12/96 1752
CCB		960729M	0.88354							09/12/96 1759
CCV		960620BB	491.06134		500.0		98.2	% REC		09/12/96 1922
CCB		960729M	0.65453							09/12/96 193
EB		0910	3.79543							09/12/96 195
MS	962376-2	960630G	68.95449		50	11.13465	115.6	% REC		09/12/96 201.
CCV		960620BB	483.10968		500.0		96.6	% REC		09/12/96 2027
CCB		960729M	0.22935							09/12/96 2040
ED	962376-4		23.40032			21.71222	1.68810	ABS Diff.		09/12/96 2059
MD	962376-4		21.58629			21.71222	0.12593	ABS Diff.		09/12/96 2102
CCV		960620BB	478.98681		500.0		95.8	% REC		09/12/96 2139
CCB		960729M	2.61586							09/12/96 2147
CCV		960620BB	474.43731		500.0		94.9	% REC		09/12/96 2337
CCB		960729M	-0.70731							09/12/96 2348
ISA		960323A	525.00854		500		105.0	% REC		09/12/96 2350
ISB		960630H	493.37231		500		98.7	% REC		09/12/96 2356
CCV		960620BB	482.57604		500.0		96.5	% REC		09/13/96 0013
CCB		960729M	-1.57056							09/13/96 0019

Test Method.....: SW-846 6010A

Batch.....: 13360

Analyst....: gag

Method Description.: Metals Analysis (ICAP)

Detection Limit....: 0.01

Parameter.....: Strontium (Sr)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960412S	0.97738		1.00		97.7	% REC		09/12/96 1012
ICB		960729M	-0.00142							09/12/96 1040
ISB		960630H	1.07494		1.0000		107.5	% REC		09/12/96 1055
CCV		960620AA	9.99453		10.0		99.9	% REC		09/12/96 1313
CCB		960729M	-0.00081							09/12/96 1324
CCV		960620AA	9.67816		10.0		96.8	% REC		09/12/96 1420
CCB		960729M	0.00040							09/12/96 1424
CCV		960620AA	9.66169		10.0		96.6	% REC		09/12/96 1524
CCB		960729M	-0.00020							09/12/96 1529
CCV		960620AA	9.67348		10.0		96.7	% REC		09/12/96 1615
CCB		960729M	-0.00040							09/12/96 1619
ISB		960630H	1.03979		1.0000		104.0	% REC		09/12/96 174
CCV		960620AA	9.93373		10.0		99.3	% REC		09/12/96 175



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Strontium (Sr)

Batch.....: 13360
Detection Limit...: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
CCB		960729M	0.00020							09/12/96 1759
CCV		960620AA	9.78409		10.0		97.8	% REC		09/12/96 1925
CCB		960729M	-0.00040							09/12/96 1937
EB		0910	0.00508							09/12/96 1959
SB		960630G	0.94710		1.0000		94.7	% REC		09/12/96 2005
MS	962376-2	960630G	1.21265		1.0000	0.21227	100.0	% REC		09/12/96 2011
PDS	962376-2	960630G	1.27588		1.0000	0.21227	106.4	% REC		09/12/96 2021
CCV		960620AA	9.85749		10.0		98.6	% REC		09/12/96 2034
CCB		960729M	0.00020							09/12/96 2040
ED	962376-4		0.13460			0.09312	36.4	RPD *		09/12/96 2059
MD	962376-4		0.09332			0.09312	0.2	RPD		09/12/96 2102
CCV		960620AA	9.56307		10.0		95.6	% REC		09/12/96 2142
CCB		960729M	-0.00020							09/12/96 2147
CCV		960620AA	9.71211		10.0		97.1	% REC		09/12/96 2340
CCB		960729M	-0.00040							09/12/96 2348
ISB		960630H	1.01657		1.0000		101.7	% REC		09/12/96 2356
CCV		960620AA	9.95448		10.0		99.5	% REC		09/13/96 0016
3		960729M	0.00244							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Tin (Sn)

Batch.....: 13360
Detection Limit...: 0.05
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960412S	0.93654		1.00		93.7	% REC		09/12/96 1012
ICB		960729M	0.01610							09/12/96 1040
ISB		960630H	0.92749		1.000		92.7	% REC		09/12/96 1055
CCV		960620AA	2.38402		2.5		95.4	% REC		09/12/96 1313
CCB		960729M	-0.00402							09/12/96 1324
CCV		960620AA	2.37543		2.5		95.0	% REC		09/12/96 1420
CCB		960729M	-0.00403							09/12/96 1424
CCV		960620AA	2.32252		2.5		92.9	% REC		09/12/96 1524
CCB		960729M	-0.00000							09/12/96 1529
CCV		960620AA	2.27824		2.5		91.1	% REC		09/12/96 1615
CCB		960729M	0.00268							09/12/96 1619
ISB		960630H	0.81558		1.000		81.6	% REC		09/12/96 1749
CCV		960620AA	2.28609		2.5		91.4	% REC		09/12/96 1755
CCB		960729M	0.00137							09/12/96 1759
CCV		960620AA	2.27873		2.5		91.1	% REC		09/12/96 1925
CCB		960729M	0.00687							09/12/96 1937
EB		0910	0.00546							09/12/96 1959
SB		960630G	0.97523		1.000		97.5	% REC		09/12/96 2005
MS	962376-2	960630G	1.00147		1.000	0.01131	99.0	% REC		09/12/96 2011
PDS	962376-2	960630G	1.01470		1.000	0.01131	100.3	% REC		09/12/96 2021
CCV		960620AA	2.30332		2.5		92.1	% REC		09/12/96 2034
CCB		960729M	0.00343							09/12/96 2040
ED	962376-4		-0.00676			-0.00460	0.00216	ABS Diff.		09/12/96 2059
MD	962376-4		0.00292			-0.00460	0.00752	ABS Diff.		09/12/96 2102
CCV		960620AA	2.25543		2.5		90.2	% REC		09/12/96 2142
B		960729M	0.00825							09/12/96 2147
V		960620AA	2.27266		2.5		90.9	% REC		09/12/96 2340



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Tin (Sn)

Batch.....: 13360
Detection Limit....: 0.05
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
CCB		960729M	-0.00412							09/12/96 2348
ISB		960630H	0.89444		1.000		89.4	% REC		09/12/96 2356
CCV		960620AA	2.32810		2.5		93.1	% REC		09/13/96 0016
CCB		960729M	0.00340							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Titanium (Ti)

Batch.....: 13360
Detection Limit....: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	2.03736		2.00		101.9	% REC		09/12/96 1005
ICB		960729M	-0.00219							09/12/96 1040
ISB		960630H	1.06617		1.000		106.6	% REC		09/12/96 1055
CCV		960620AA	2.61759		2.5		104.7	% REC		09/12/96 1313
CCB		960729M	-0.00109							09/12/96 1324
CCV		960620AA	2.54384		2.5		101.8	% REC		09/12/96 142
CCB		960729M	-0.00048							09/12/96 142
CCV		960620AA	2.54858		2.5		101.9	% REC		09/12/96 1524
CCB		960729M	-0.00106							09/12/96 1529
CCV		960620AA	2.54748		2.5		101.9	% REC		09/12/96 1615
CCB		960729M	-0.00107							09/12/96 1619
ISB		960630H	1.02213		1.000		102.2	% REC		09/12/96 1749
CCV		960620AA	2.56886		2.5		102.8	% REC		09/12/96 1755
CCB		960729M	-0.00159							09/12/96 1759
CCV		960620AA	2.52793		2.5		101.1	% REC		09/12/96 1925
CCB		960729M	-0.00106							09/12/96 1937
EB		0910	-0.00154							09/12/96 1959
SB		960630G	0.99452		1.000		99.5	% REC		09/12/96 2005
MS	962376-2	960630G	1.04462		1.000	0.00012	104.5	% REC		09/12/96 2011
PDS	962376-2	960630G	1.08875		1.000	0.00012	108.9	% REC		09/12/96 2021
CCV		960620AA	2.55339		2.5		102.1	% REC		09/12/96 2034
CCB		960729M	-0.00161							09/12/96 2040
ED	962376-4		-0.00036			-0.00000	0.00036	ABS Diff.		09/12/96 2059
MD	962376-4		-0.00052			-0.00000	0.00052	ABS Diff.		09/12/96 2102
CCV		960620AA	2.49786		2.5		99.9	% REC		09/12/96 2142
CCB		960729M	-0.00209							09/12/96 2147
CCV		960620AA	2.52640		2.5		101.1	% REC		09/12/96 2340
CCB		960729M	-0.00108							09/12/96 2348
ISB		960630H	1.01657		1.000		101.7	% REC		09/12/96 2356
CCV		960620AA	2.58086		2.5		103.2	% REC		09/13/96 0016
CCB		960729M	-0.00002							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Vanadium (V)

Batch.....: 13360
Detection Limit....: 0.05
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	1.99487		2.00		99.7	% REC		09/12/96 100
ICB		960729M	0.00175							09/12/96 104



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Vanadium (V)

Batch.....: 13360
Detection Limit....: 0.05
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ISB		960630H	0.49124		0.5000		98.2	% REC		09/12/96 1055
CCV		960620AA	2.52424		2.5		101.0	% REC		09/12/96 1313
CCB		960729M	-0.00004							09/12/96 1324
CCV		960620AA	2.50191		2.5		100.1	% REC		09/12/96 1420
CCB		960729M	0.00162							09/12/96 1424
CCV		960620AA	2.45562		2.5		98.2	% REC		09/12/96 1524
CCB		960729M	0.00008							09/12/96 1529
CCV		960620AA	2.45289		2.5		98.1	% REC		09/12/96 1615
CCB		960729M	0.00108							09/12/96 1619
ISB		960630H	0.46886		0.5000		93.8	% REC		09/12/96 1749
CCV		960620AA	2.46294		2.5		98.5	% REC		09/12/96 1755
CCB		960729M	0.00067							09/12/96 1759
CCV		960620AA	2.44546		2.5		97.8	% REC		09/12/96 1925
CCB		960729M	0.00063							09/12/96 1937
EB		0910	0.00226							09/12/96 1959
SB		960630G	0.95798		1.000		95.8	% REC		09/12/96 2005
MC	962376-2	960630G	1.00675		1.000	0.00091	100.6	% REC		09/12/96 2011
	962376-2	960630G	1.04459		1.000	0.00091	104.4	% REC		09/12/96 2021
		960620AA	2.45053		2.5		98.0	% REC		09/12/96 2034
CCB		960729M	-0.00058							09/12/96 2040
ED	962376-4		0.00727			0.00734	0.00007	ABS Diff.		09/12/96 2059
MD	962376-4		0.00959			0.00734	0.00225	ABS Diff.		09/12/96 2102
CCV		960620AA	2.39003		2.5		95.6	% REC		09/12/96 2142
CCB		960729M	0.00112							09/12/96 2147
CCV		960620AA	2.42856		2.5		97.1	% REC		09/12/96 2340
CCB		960729M	0.00100							09/12/96 2348
ISB		960630H	0.46385		0.5000		92.8	% REC		09/12/96 2356
CCV		960620AA	2.44980		2.5		98.0	% REC		09/13/96 0016
CCB		960729M	0.00067							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Zinc (Zn)

Batch.....: 13360
Detection Limit....: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	2.01261		2.00		100.6	% REC		09/12/96 1005
ICB		960729M	0.00001							09/12/96 1040
ISB		960630H	0.99510		1.000		99.5	% REC		09/12/96 1055
CCV		960620AA	2.47998		2.5		99.2	% REC		09/12/96 1313
CCB		960729M	0.00000							09/12/96 1324
CCV		960620AA	2.45114		2.5		98.0	% REC		09/12/96 1420
CCB		960729M	-0.00074							09/12/96 1424
CCV		960620AA	2.43459		2.5		97.4	% REC		09/12/96 1524
CCB		960729M	0.00001							09/12/96 1529
CCV		960620AA	2.40220		2.5		96.1	% REC		09/12/96 1615
CCB		960729M	-0.00000							09/12/96 1619
ISB		960630H	0.92332		1.000		92.3	% REC		09/12/96 1749
CCV		960620AA	2.28459		2.5		91.4	% REC		09/12/96 1755
CCB		960729M	-0.00152							09/12/96 1759
		960620AA	2.37849		2.5		95.1	% REC		09/12/96 1925
		960729M	-0.00082							09/12/96 1937



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Zinc (Zn)

Batch.....: 13360
Detection Limit....: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
EB		0910	0.31606							09/12/96 1959
SB		960630G	1.18315		1.000		118.3	% REC		09/12/96 2005
MS	962376-2	960630G	1.39022		1.000	0.34961	104.1	% REC		09/12/96 2011
PDS	962376-2	960630G	1.40795		1.000	0.34961	105.8	% REC		09/12/96 2021
CCV		960620AA	2.41229		2.5		96.5	% REC		09/12/96 2034
CCB		960729M	-0.00000							09/12/96 2040
ED	962376-4		0.16799			0.20890	21.7	RPD *		09/12/96 2059
MD	962376-4		0.23758			0.20890	12.8	RPD		09/12/96 2102
CCV		960620AA	2.37755		2.5		95.1	% REC		09/12/96 2142
CCB		960729M	0.00084							09/12/96 2147
CCV		960620AA	2.35544		2.5		94.2	% REC		09/12/96 2340
CCB		960729M	0.00165							09/12/96 2348
ISB		960630H	0.96958		1.000		97.0	% REC		09/12/96 2356
CCV		960620AA	2.38712		2.5		95.5	% REC		09/13/96 0016
CCB		960729M	0.00245							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Arsenic (As)

Batch.....: 13360
Detection Limit....: 0.05
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	2.02135		2.00		101.1	% REC		09/12/96 1005
ICB		960729M	-0.00536							09/12/96 1040
ISB		960630H	0.97042		1.000		97.0	% REC		09/12/96 1055
CCV		960620AA	2.53608		2.5		101.4	% REC		09/12/96 1313
CCB		960729M	0.00538							09/12/96 1324
CCV		960620AA	2.43255		2.5		97.3	% REC		09/12/96 1420
CCB		960729M	-0.00021							09/12/96 1424
CCV		960620AA	2.45239		2.5		98.1	% REC		09/12/96 1524
CCB		960729M	-0.00987							09/12/96 1529
CCV		960620AA	2.45326		2.5		98.1	% REC		09/12/96 1615
CCB		960729M	-0.00032							09/12/96 1619
ISB		960630H	0.80772		1.000		80.8	% REC		09/12/96 1749
CCV		960620AA	2.39849		2.5		95.9	% REC		09/12/96 1755
CCB		960729M	-0.00028							09/12/96 1759
CCV		960620AA	2.36976		2.5		94.8	% REC		09/12/96 1925
CCB		960729M	-0.02721							09/12/96 1937
EB		0910	-0.00902							09/12/96 1959
SB		960630G	0.96618		1.000		96.6	% REC		09/12/96 2005
MS	962376-2	960630G	0.97743		1.000	0.00722	97.0	% REC		09/12/96 2011
PDS	962376-2	960630G	1.00685		1.000	0.00722	100.0	% REC		09/12/96 2021
CCV		960620AA	2.37200		2.5		94.9	% REC		09/12/96 2034
CCB		960729M	-0.00570							09/12/96 2040
ED	962376-4		0.00953			0.01480	0.00527	ABS Diff.		09/12/96 2059
MD	962376-4		0.00308			0.01480	0.01172	ABS Diff.		09/12/96 2102
CCV		960620AA	2.35831		2.5		94.3	% REC		09/12/96 2142
CCB		960729M	0.00935							09/12/96 2147
CCV		960620AA	2.32990		2.5		93.2	% REC		09/12/96 2340
CCB		960729M	0.00938							09/12/96 2348
ISB		960630H	1.12603		1.000		112.6	% REC		09/12/96 2356
CCV		960620AA	2.44382		2.5		97.8	% REC		09/13/96 0016



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Arsenic (As)

Batch.....: 13360
Detection Limit....: 0.05
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
CCB		960729M	-0.00671							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Beryllium (Be)

Batch.....: 13360
Detection Limit....: 0.005
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	2.12870		2.00		106.4	% REC		09/12/96 1005
ICB		960729M	0.00022							09/12/96 1040
ISB		960630H	0.51114		0.5000		102.2	% REC		09/12/96 1055
CCV		960620AA	2.54255		2.5		101.7	% REC		09/12/96 1313
CCB		960729M	0.00047							09/12/96 1324
CCV		960620AA	2.47467		2.5		99.0	% REC		09/12/96 1420
CCB		960729M	0.00117							09/12/96 1424
CCV		960620AA	2.47748		2.5		99.1	% REC		09/12/96 1524
		960729M	0.00047							09/12/96 1529
		960620AA	2.46727		2.5		98.7	% REC		09/12/96 1615
		960729M	0.00118							09/12/96 1619
ISB		960630H	0.48754		0.5000		97.5	% REC		09/12/96 1749
CCV		960620AA	2.51193		2.5		100.5	% REC		09/12/96 1755
CCB		960729M	0.00046							09/12/96 1759
CCV		960620AA	2.46091		2.5		98.4	% REC		09/12/96 1925
CCB		960729M	0.00047							09/12/96 1937
EB		0910	0.00045							09/12/96 1959
SB		960630G	0.96008		1.000		96.0	% REC		09/12/96 2005
MS 962376-2		960630G	1.02105		1.000	0.00118	102.0	% REC		09/12/96 2011
PDS 962376-2		960630G	1.05689		1.000	0.00118	105.6	% REC		09/12/96 2021
CCV		960620AA	2.48181		2.5		99.3	% REC		09/12/96 2034
CCB		960729M	0.00048							09/12/96 2040
ED 962376-4			0.00040			0.00040	0.00000	ABS Diff.		09/12/96 2059
MD 962376-4			0.00014			0.00040	0.00026	ABS Diff.		09/12/96 2102
CCV		960620AA	2.42809		2.5		97.1	% REC		09/12/96 2142
CCB		960729M	0.00046							09/12/96 2147
CCV		960620AA	2.44131		2.5		97.7	% REC		09/12/96 2340
CCB		960729M	0.00046							09/12/96 2348
ISB		960630H	0.47807		0.5000		95.6	% REC		09/12/96 2356
CCV		960620AA	2.48015		2.5		99.2	% REC		09/13/96 0016
CCB		960729M	0.00118							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Lead (Pb)

Batch.....: 13360
Detection Limit....: 0.05
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	2.00381		2.00		100.2	% REC		09/12/96 1005
ICB		960729M	-0.00697							09/12/96 1040
ISB		960630H	0.89654		1.000		89.7	% REC		09/12/96 1055
		960620AA	2.50297		2.5		100.1	% REC		09/12/96 1313
		960729M	-0.00306							09/12/96 1324



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Lead (Pb)

Batch.....: 13360
Detection Limit....: 0.05
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
CCV		960620AA	2.46212		2.5		98.5	% REC		09/12/96 1420
CCB		960729M	-0.00077							09/12/96 1424
CCV		960620AA	2.42427		2.5		97.0	% REC		09/12/96 1524
CCB		960729M	-0.00151							09/12/96 1529
CCV		960620AA	2.41891		2.5		96.8	% REC		09/12/96 1615
CCB		960729M	0.00324							09/12/96 1619
ISB		960630H	0.94029		1.000		94.0	% REC		09/12/96 1749
CCV		960620AA	2.29197		2.5		91.7	% REC		09/12/96 1755
CCB		960729M	-0.01805							09/12/96 1759
CCV		960620AA	2.27815		2.5		91.1	% REC		09/12/96 1925
CCB		960729M	-0.01097							09/12/96 1937
EB		0910	0.00601							09/12/96 1959
SB		960630G	0.99606		1.000		99.6	% REC		09/12/96 2005
MS	962376-2	960630G	1.00569		1.000	-0.00259	100.8	% REC		09/12/96 2011
PDS	962376-2	960630G	1.01688		1.000	-0.00259	101.9	% REC		09/12/96 2021
CCV		960620AA	2.30767		2.5		92.3	% REC		09/12/96 2034
CCB		960729M	-0.00074							09/12/96 2040
ED	962376-4		-0.01807			0.01660	0.03467	ABS Diff.		09/12/96 205
MD	962376-4		0.00161			0.01660	0.01499	ABS Diff.		09/12/96 210
CCV		960620AA	2.28106		2.5		91.2	% REC		09/12/96 214
CCB		960729M	0.00240							09/12/96 2147
CCV		960620AA	2.28480		2.5		91.4	% REC		09/12/96 2340
CCB		960729M	0.00481							09/12/96 2348
ISB		960630H	0.96117		1.000		96.1	% REC		09/12/96 2356
CCV		960620AA	2.29021		2.5		91.6	% REC		09/13/96 0016
CCB		960729M	-0.00616							09/13/96 0019

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Selenium (Se)

Batch.....: 13360
Detection Limit....: 0.1
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	2.12327		2.00		106.2	% REC		09/12/96 1005
ICB		960729M	0.00347							09/12/96 1040
ISB		960630H	1.04184		1.000		104.2	% REC		09/12/96 1055
CCV		960620AA	2.62732		2.5		105.1	% REC		09/12/96 1313
CCB		960729M	0.02090							09/12/96 1324
CCV		960620AA	2.62248		2.5		104.9	% REC		09/12/96 1420
CCB		960729M	0.00461							09/12/96 1424
CCV		960620AA	2.49829		2.5		99.9	% REC		09/12/96 1524
CCB		960729M	0.01741							09/12/96 1529
CCV		960620AA	2.44127		2.5		97.7	% REC		09/12/96 1615
CCB		960729M	0.03716							09/12/96 1619
ISB		960630H	0.81507		1.000		81.5	% REC		09/12/96 1749
CCV		960620AA	2.48537		2.5		99.4	% REC		09/12/96 1755
CCB		960729M	0.05578							09/12/96 1759
CCV		960620AA	2.41899		2.5		96.8	% REC		09/12/96 1925
CCB		960729M	0.06392							09/12/96 1937
EB		0910	0.02091							09/12/96 1959
SB		960630G	0.98223		1.000		98.2	% REC		09/12/96 200
MS	962376-2	960630G	1.03140		1.000	0.05485	97.7	% REC		09/12/96 201



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Selenium (Se)

Batch.....: 13360
Detection Limit...: 0.1
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
PDS	962376-2	960630G	1.13366		1.000	0.05485	107.9	% REC		09/12/96 2021
CCV		960620AA	2.45630		2.5		98.3	% REC		09/12/96 2034
CCB		960729M	0.05347							09/12/96 2040
ED	962376-4		0.06638			0.06867	0.00229	ABS Diff.		09/12/96 2059
MD	962376-4		0.03496			0.06867	0.03371	ABS Diff.		09/12/96 2102
CCV		960620AA	2.51892		2.5		100.8	% REC		09/12/96 2142
CCB		960729M	0.01859							09/12/96 2147
CCV		960620AA	2.40724		2.5		96.3	% REC		09/12/96 2340
CCB		960729M	-0.00696							09/12/96 2348
ISB		960630H	0.86380		1.000		86.4	% REC		09/12/96 2356
CCV		960620AA	2.44220		2.5		97.7	% REC		09/13/96 0016
CCB		960729M	0.03371							09/13/96 0019

Test Method.....: ASTM 3111B
Method Description.: Bismuth & Gallium (FLAA)
Parameter.....: Gallium (Ga)

Batch.....: 13363
Detection Limit...: 0.5
Units.....: mg/L

Analyst....: lmt

	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		951219D	19.07		20.12		94.8	% REC		09/12/96 1650
ICB		09126	-0.05							09/12/96 1650
CCV		960909G	23.40		25.000000		93.6	% REC		09/12/96 1650
CCB		09126	0.19							09/12/96 1650
CCV		960909G	23.27		25.000000		93.1	% REC		09/12/96 1650
CCB		09126	0.35							09/12/96 1650
CCV		960909G	23.05		25.000000		92.2	% REC		09/12/96 1650
CCB		09126	0.43							09/12/96 1650
EB		1312	0.15							09/12/96 1650
SB		950729	9.54		10.060000		94.8	% REC		09/12/96 1650
CCV		960909G	22.81		25.000000		91.2	% REC		09/12/96 1650
CCB		09126	0.44							09/12/96 1650
MS	962376-2	950729	9.57		10.060000	0.16	93.5	% REC		09/12/96 1650
ED	962376-4		0.08			0.04	0.04	ABS Diff.		09/12/96 1650
MD	962376-4		0.15			0.04	0.11	ABS Diff.		09/12/96 1650
CCV		960909G	23.06		25.000000		92.2	% REC		09/12/96 1650
CCB		09126	0.34							09/12/96 1650

Test Method.....: EPA 150.1
Method Description.: pH
Parameter.....: pH

Batch.....: 13417
Detection Limit...: 0.01
Units.....: pH Units

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		G960604A	4.01		4.00		100.2	% REC		09/19/96 1130
MD	960850-97		7.05			7.50	6.2	RPD		09/19/96 1130
CCV		960258	7.00		7.00		100.0	% REC		09/19/96 1130
MD	962115-56		6.59			6.47	1.8	RPD		09/19/96 1130
CCV		960258	6.98		7.00		99.7	% REC		09/19/96 1130
CCV		960258	7.00		7.00		100.0	% REC		09/19/96 1130
	962376-4		8.27			8.21	0.7	RPD		09/19/96 1130
		960258	7.00		7.00		100.0	% REC		09/19/96 1130



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962376

Date: 09/20/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD 96228

ATTN: Daniel Davis

Test Method.....: EPA 310.1

Method Description.: Alkalinity

Parameter.....: Alkalinity, Total as CaCO₃

Batch.....: 13418

Detection Limit....: 5

Units.....: mg/L CaCO₃

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
MB			0							09/19/96 1130
LCS		G960725A	106		100		106.0	% REC		09/19/96 1130
MD	960850-97		31			32	3.2	RPD		09/19/96 1130
MD	962115-56		6			8	2	ABS Diff.		09/19/96 1130
LCS		G960725A	96		100		96.0	% REC		09/19/96 1130
MD	962115-66		0			0	0	ABS Diff.		09/19/96 1130
ED	962376-4		34			40	16.2	RPD		09/19/96 1130
EB			0							09/19/96 1130

Test Method.....: EPA 353.2

Method Description.: Nitrogen, NO₂, NO₃ (Auto Cd Red.)

Parameter.....: Nitrate + Nitrite as N

Batch.....: 13426

Detection Limit....: 0.05

Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICL		G951016A	1.01		1.000000		101.0	% REC		09/19/96 1000
ICB			0.00							09/19/96 100
EB			0.00							09/19/96 100
ED	962376-4		0.00			0.00	0	ABS Diff.		09/19/96 1000
MD	962578-1		0.00			0.00	0	ABS Diff.		09/19/96 1000
MS	962578-1	G951109	1.06		1.000000	0.00	106.0	% REC		09/19/96 1000
CCV		G951109	2.04		2.000000		102.0	% REC		09/19/96 1000
CCB			0.00							09/19/96 1000

**QUALITY ASSURANCE METHODS****REFERENCES AND NOTES**

Report Date: 09/20/96

- (1) EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, March 1983
- (2) EPA SW-846, Test Methods for Evaluating Solid Waste, Third Edition, 1989
- (3) Standard Methods for The Examination of Water and Wastewater, 17th Edition, 1989
- (4) EPA 600/4-80-032, Prescribed Procedures For Measurement Of Radioactivity In Drinking Water, August 1980
- (5) EPA 600/8-78-017, Microbiological Methods For Monitoring The Environment, December 1978
- (6) Federal Register, July 1, 1990 (40 CFR Part 136)
- (7) EPA 600/4-88-03, Methods For The Determination of Organics Compounds in Drinking Water, December 1988
- (8) U.S.G.S. Methods For Determination of Inorganic Substances In Water And Fluvial Sediments, Book 5, Chapter A1, 1985
- (9) Federal Register, Friday, June 7, 1991 (40 CFR Parts 141 & 142)
- (10) Standard Methods For The Examination of Water and Wastewater, 16th Edition, 1985
- (11) ASTM, Section 11 Water and Environmental Technology, Volume 11.01 Water (1), 1991
- (12) Methods of Soil Analysis, American Society of Agronomy, Agronomy No. 9, 1965
- (13) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, Revision 1, November 1990
- (14) ASTM, Section 5, Petroleum Products, Lubricants, and Fossil Fuels, Volume 05.05, Gaseous Fuels, Coal, and Coke
- (15) EPA 600/2-78-054, Field and Laboratory Methods Applicable To Overburdens and Mine Soils, March 1978
- (16) ASTM, Part 19, Soils and Rocks; Building Stones, 1981

Comments: Data in the QA report may differ from final results due to digestion and/or dilution of sample into analytical ranges. The "Time Analyzed" in the QA report refers to the start time of the analytical batch which may not reflect the actual time of each analysis. The "Date Analyzed" is the actual date of analysis. Results for soil and sludge samples are reported on a wet weight basis (i.e. not corrected for percent moisture) unless otherwise indicated.

NC = Not Calculable Due to Value(s) lower than the Detection Limit.

BLANK QC SAMPLE IDENTIFICATION



CORE LABORATORIES

QUALITY ASSURANCE METHODS

REFERENCES AND NOTES

Report Date: 09/20/96

MB Method Blank
ICB Initial Calibration Blank
CCB Continuing Calibration Blank

SPIKE QC SAMPLE IDENTIFICATION

MS Method (Matrix) Spike
MSD Method (Matrix) Spike Duplicate
PDS Post Digestion Spike
SB Spiked Blank
SBD Spike Blank Duplicate

REFERENCE STANDARD QC SAMPLE IDENTIFICATION

LCS Laboratory Control Standard
RS Reference Standard
ICV Initial Calibration Verification Standard
CCV Continuing Calibration Verification Standard
ISA/ISB ICP Interface Check Sample
ICL Initial Calibration/Laboratory Control Sample
DSC Distilled Standard Check

DUPLICATE QC SAMPLE IDENTIFICATION

MD Method (Matrix) Duplicate
ED Extraction Duplicate
DD Digestion Duplicate

Analyses performed by a subcontract laboratory are indicated on the analytical and/or quality control reports under "technician" using the following codes:

SUBCONTRACT LABORATORY	CODE
Core Laboratories - Anaheim, CA	* AN
Core Laboratories - Casper, WY	* CA
Core Laboratories - Corpus Christi, TX	* CC
Core Laboratories - Houston, TX	* HP
Core Laboratories - Lake Charles, LA	* LC
Core Laboratories - Long Beach, CA	* LB
Other Subcontract Laboratories	* XX

EXPLANATION OF DATA FLAGS

- B - This flag is used to indicate that an analyte is present in the method blank as well as in the sample. It indicates that the client should consider this when evaluating the results.
- D - This flag indicates that surrogates were diluted out of calibration range and cannot be quantified.
- E - Indicates that a sample result is an estimate because the concentration exceeded the calibration range of the instrument.
- I - Used to indicate matrix interference.
- J - Indicates that a value is an estimate. It is used when a compound is determined to be present based on the mass spectral data, but at a concentration less than the practical quantitation limit of the method.



QUALITY ASSURANCE METHODS

REFERENCES AND NOTES

Report Date: 09/20/96

- This flag is also used when estimating the concentration of a tentatively identified compound.
- X - Indicates that a surrogate recovery is outside the specified quality control limits.
 - Y - Used to identify a spike or spike duplicate recovery that is outside the specified quality control limits.
 - Z - Indicates a relative percent difference for a spike and spike duplicate is outside the specified quality control limits.
 - * - Indicates a relative percent difference for a duplicate analysis is outside the specified quality control limits.
 - ^ - Used to indicate that a standard is outside specified quality control limits.

APPENDIX B

MODEL OUTPUT FOR EQUILIBRATION OF GROUND WATER (WC-5A) WITH WASTE BACKFILL MATERIAL

EQUILIBRATION OF GROUNDWATER (WC-5A) WITH WASTE BACKFILL MATERIAL
 PCO2=10E-3.5, INFINITE CALCITE, HEMATITE, APATITE

 Temperature (Celsius): 25.00
 Units of concentration: MG/L
 Ionic strength to be computed.
 If specified, carbonate concentration represents total inorganic carbon.
 Do not automatically terminate if charge imbalance exceeds 30%
 Precipitation is allowed for all solids in the thermodynamic database and
 the print option for solids is set to: 2
 The maximum number of iterations is: 100
 The method used to compute activity coefficients is: Davies equation
 Intermediate output file

330 2.470E-05 -7.61 y
 140 1.206E+02 -2.70 y
 100 3.000E-02 -6.66 y
 110 1.000E-03 -6.95 y
 90 4.235E+00 -4.16 y
 150 5.940E+01 -2.83 y
 180 1.620E+02 -2.34 y
 270 8.000E-01 -4.38 y
 440 7.000E-02 -5.00 y
 460 1.610E+01 -3.18 y
 471 4.700E-01 -5.07 y
 492 2.657E-01 -5.37 y
 580 3.000E-02 -6.50 y
 410 1.200E+01 -3.51 y
 500 2.330E+02 -1.99 y
 800 1.300E+00 -4.83 y
 732 3.100E+02 -2.49 y
 1 0.000E-01 -0.85 y
 281 5.000E-01 -5.27
 280 1.000E-01 -5.27

H2O has been inserted as a COMPONENT

3 6
 3301403 21.6600 -0.5300
 5015001 8.4750 2.5850
 3028100 4.0080 30.8450
 2802810 13.0320 -10.0000
 7015002 114.4000 -39.3900
 7015003 44.1990 0.0000
 6 3
 1 0.0000 0.0000
 3028000 -3.7370 50.4600
 5015002 17.0000 8.2900

INPUT DATA BEFORE TYPE MODIFICATIONS

ID	NAME	ACTIVITY GUESS	LOG GUESS	ANAL TOTAL
330	H+1	2.455E-08	-7.610	2.470E-05
140	CO3-2	1.995E-03	-2.700	1.206E+02
100	Ba+2	2.188E-07	-6.660	3.000E-02
110	Be+2	1.122E-07	-6.950	1.000E-03
90	H3BO3	6.918E-05	-4.160	4.235E+00
150	Ca+2	1.479E-03	-2.830	5.940E+01
180	Cl-1	4.571E-03	-2.340	1.620E+02
270	F-1	4.169E-05	-4.380	8.000E-01
440	Li+1	1.000E-05	-5.000	7.000E-02
460	Mg+2	6.607E-04	-3.180	1.610E+01
471	Mn+3	8.511E-06	-5.070	4.700E-01
492	NO3-1	4.266E-06	-5.370	2.657E-01
580	PO4-3	3.162E-07	-6.500	3.000E-02
410	K+1	3.090E-04	-3.510	1.200E+01
500	Na+1	1.023E-02	-1.990	2.330E+02
800	Sr+2	1.479E-05	-4.830	1.300E+00
732	SO4-2	3.236E-03	-2.490	3.100E+02
1	E-1	1.413E-01	-0.850	0.000E-01
281	Fe+3	5.370E-06	-5.270	5.000E-01
280	Fe+2	5.370E-06	-5.270	1.000E-01
2	H2O	1.000E+00	0.000	0.000E-01

Charge Balance: UNSPECIATED

Sum of CATIONS= 1.484E-02 Sum of ANIONS = 1.510E-02

PERCENT DIFFERENCE = 8.806E-01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

IMPROVED ACTIVITY GUESSES PRIOR TO FIRST ITERATION:

CO3-2	Log activity guess:	-6.44
PO4-3	Log activity guess:	-11.38
SO4-2	Log activity guess:	-2.49
Fe+2	Log activity guess:	-4.97
Fe+3	Log activity guess:	-18.01

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:19:46

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
0	K+1	3.072E-04	8.872E-06	-3.51000	8.841E-06
1	K+1	3.072E-04	-6.362E-07	-3.53736	6.055E-07
2	K+1	3.072E-04	1.782E-05	-3.54485	1.779E-05
3	K+1	3.072E-04	2.905E-05	-3.56770	2.902E-05
4	Mg+2	-3.395E-03	-1.598E+06	-3.82065	1.598E+06
5	Mg+2	-3.395E-03	-6.406E+05	-3.91633	6.406E+05
6	Mg+2	-3.395E-03	-2.546E+05	-3.97881	2.545E+05
7	Mg+2	-3.395E-03	-1.005E+05	-4.01067	1.005E+05
8	Mg+2	-3.395E-03	-3.960E+04	-4.02570	3.959E+04
9	Mg+2	-3.395E-03	-1.558E+04	-4.03258	1.558E+04
10	Mg+2	-3.395E-03	-6.125E+03	-4.03569	6.125E+03
11	Mg+2	-3.395E-03	-2.408E+03	-4.03709	2.408E+03
12	Mg+2	-3.395E-03	-9.466E+02	-4.03771	9.465E+02
13	Mg+2	-3.395E-03	-3.721E+02	-4.03795	3.720E+02
14	Mg+2	-3.395E-03	-1.462E+02	-4.03795	1.462E+02
15	Mg+2	-3.395E-03	-5.745E+01	-4.03770	5.745E+01
16	Mg+2	-3.395E-03	-2.256E+01	-4.03694	2.256E+01
17	Mg+2	-3.395E-03	-8.844E+00	-4.03497	8.843E+00
18	Mg+2	-3.395E-03	-3.454E+00	-4.02998	3.453E+00
19	Mg+2	-3.395E-03	-1.337E+00	-4.01766	1.337E+00
20	Mg+2	-3.395E-03	-5.104E-01	-3.98846	5.103E-01
21	K+1	3.072E-04	-4.540E-08	-3.59691	1.469E-08
22	K+1	3.072E-04	-8.381E-08	-3.58974	5.309E-08
23	K+1	3.072E-04	-4.656E-08	-3.58434	1.584E-08
24	Mg+2	-3.395E-03	-6.506E-02	-3.56610	6.506E-02
25	Mg+2	-3.395E-03	-7.140E-02	-3.52083	7.139E-02
26	Mg+2	-3.395E-03	-7.056E-02	-3.51017	7.055E-02
27	Mg+2	-3.395E-03	-5.042E-02	-3.50894	5.041E-02
28	Mg+2	-3.395E-03	-2.201E-02	-3.50917	2.201E-02
29	Mg+2	-3.395E-03	-7.449E-03	-3.50928	7.448E-03
30	Mg+2	-3.395E-03	-2.126E-03	-3.50925	2.126E-03
31	Mg+2	-3.395E-03	-3.637E-04	-3.50924	3.632E-04
32	Mg+2	-3.395E-03	-1.655E-05	-3.50924	1.614E-05
34	K+1	3.072E-04	-5.682E-06	-3.58146	5.652E-06
35	K+1	3.072E-04	-1.256E-07	-3.57370	9.484E-08
36	Sr+2	1.485E-05	-1.730E-09	-5.05026	2.449E-10

IO	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	2.453E-08	3.722E-09	-8.48474	0.880063	4.286E-08
732	SO4-2	3.230E-03	2.973E-03	-2.74868	0.599866	-8.382E-09
100	Ba+2	2.186E-07	2.186E-07	-6.88223	0.599866	-6.122E-13
110	Be+2	1.111E-07	1.111E-07	-7.17638	0.599866	-3.110E-13
90	H3BO3	6.855E-05	5.713E-05	-4.24154	1.003705	-5.268E-12
1	E-1	0.000E-01	2.283E+08	8.35856	0.880063	-4.048E-12
180	Cl-1	4.574E-03	4.574E-03	-2.39522	0.880063	-3.202E-09
270	F-1	4.215E-05	9.308E-08	-7.08664	0.880063	4.872E-08
440	Li+1	1.010E-05	1.002E-05	-5.05465	0.880063	-7.068E-12
460	Mg+2	6.628E-04	5.445E-04	-3.48596	0.599866	1.306E-09
471	Mn+3	8.563E-06	8.563E-06	-5.56675	0.316682	-5.395E-11
492	NO3-1	4.289E-06	4.289E-06	-5.42312	0.880063	-3.002E-12
800	Sr+2	1.485E-05	1.485E-05	-5.05021	0.599866	-4.158E-11
410	K+1	3.072E-04	3.034E-04	-3.57351	0.880063	-2.150E-10
140	CO3-2	2.012E-03	3.398E-05	-4.69069	0.599866	0.000E-01
580	PO4-3	3.162E-07	1.759E-11	-11.25413	0.316682	3.388E-21
2	H2O	-8.470E-22	-8.113E-04	-0.00017	1.000000	0.000E-01
150	Ca+2	1.483E-03	2.740E-04	-3.78423	0.599866	0.000E-01
280	Fe+2	1.792E-06	1.427E-06	-6.06740	0.599866	0.000E-01
281	Fe+3	8.961E-06	1.100E-27	-27.45796	0.316682	0.000E-01
500	Na+1	1.014E-02	1.004E-02	-2.05386	0.880063	1.592E-22

Type 1 - COMPONENTS AS SPECIES IN SOLUTION

ID	NAME	CALC MOL	ACTIVITY	LOG ACTVTY	GAMMA	NEW LOGK
330	H+1	3.722E-09	3.275E-09	-8.48474	0.88006	0.055
140	CO3-2	3.398E-05	2.038E-05	-4.69069	0.59987	0.222
100	Ba+2	2.186E-07	1.312E-07	-6.88223	0.59987	0.222
110	Be+2	1.111E-07	6.662E-08	-7.17638	0.59987	0.222
90	H3BO3	5.713E-05	5.734E-05	-4.24154	1.00370	-0.002
150	Ca+2	2.740E-04	1.643E-04	-3.78423	0.59987	0.222
180	Cl-1	4.574E-03	4.025E-03	-2.39522	0.88006	0.055
270	F-1	9.308E-08	8.191E-08	-7.08664	0.88006	0.055
440	Li+1	1.002E-05	8.818E-06	-5.05465	0.88006	0.055
460	Mg+2	5.445E-04	3.266E-04	-3.48596	0.59987	0.222
471	Mn+3	8.563E-06	2.712E-06	-5.56675	0.31668	0.499
492	NO3-1	4.289E-06	3.775E-06	-5.42312	0.88006	0.055
580	PO4-3	1.759E-11	5.570E-12	-11.25413	0.31668	0.499
410	K+1	3.034E-04	2.670E-04	-3.57351	0.88006	0.055
500	Na+1	1.004E-02	8.834E-03	-2.05386	0.88006	0.055
800	Sr+2	1.485E-05	8.908E-06	-5.05021	0.59987	0.222
732	SO4-2	2.973E-03	1.784E-03	-2.74868	0.59987	0.222
280	Fe+2	1.427E-06	8.563E-07	-6.06740	0.59987	0.222
281	Fe+3	1.100E-27	3.484E-28	-27.45796	0.31668	0.499

Type II - OTHER SPECIES IN SOLUTION OR ADSORBED

ID	NAME	CALC MOL	ACTIVITY	LOG ACTVTY	GAMMA	NEW LOGK
3305801	H2PO4 -	2.426E-09	2.135E-09	-8.67061	0.88006	19.608
3305802	H3PO4	9.774E-16	9.810E-16	-15.00834	1.00370	21.698
3300020	OH-	3.484E-06	3.066E-06	-5.51343	0.88006	-13.943
3300900	H2BO3 -1	1.143E-05	1.006E-05	-4.99761	0.88006	-9.185
902700	BF(OH)3 -	2.130E-12	1.874E-12	-11.72718	0.88006	-0.344
902701	BF2(OH)2 -	6.111E-20	5.378E-20	-19.26939	0.88006	7.685
902702	BF3OH -	1.786E-29	1.572E-29	-28.80361	0.88006	13.722
902703	BF4 -	1.939E-38	1.707E-38	-37.76782	0.88006	20.329
4603300	MgOH +	1.862E-07	1.639E-07	-6.78550	0.88006	-11.729
4602700	MgF +	2.009E-09	1.768E-09	-8.75260	0.88006	1.875
4601400	MgCO3 AQ	6.331E-06	6.354E-06	-5.19693	1.00370	2.978
4601401	MgHCO3 +	6.155E-06	5.417E-06	-5.26627	0.88006	11.451
4607320	MgSO4 AQ	1.032E-04	1.036E-04	-3.98464	1.00370	2.248
4605800	MgPO4 -	8.024E-09	7.062E-09	-8.15109	0.88006	6.644
4605801	MgH2PO4 +	2.582E-11	2.272E-11	-10.64357	0.88006	21.121
4605802	MgHPO4 AQ	9.853E-09	9.889E-09	-8.00483	1.00370	15.218
1503300	CaOH +	1.438E-08	1.266E-08	-7.89766	0.88006	-12.543
1501400	CaHCO3 +	2.760E-06	2.429E-06	-5.61457	0.88006	11.401
1501401	CaCO3 AQ	4.743E-06	4.761E-06	-5.32232	1.00370	3.151
1507320	CaSO4 AQ	5.949E-05	5.971E-05	-4.22392	1.00370	2.307
1505800	CaHPO4 AQ	3.633E-09	3.647E-09	-8.43810	1.00370	15.083
1505801	CaPO4 -	2.993E-09	2.634E-09	-8.57937	0.88006	6.514
1505802	CaH2PO4 +	1.018E-11	8.957E-12	-11.04784	0.88006	21.015
1502700	CaF +	1.332E-10	1.173E-10	-9.93088	0.88006	0.995
5001400	NaCO3 -	3.793E-06	3.338E-06	-5.47655	0.88006	1.323
5001401	NaHCO3 AQ	7.065E-06	7.091E-06	-5.14929	1.00370	10.078
5007320	NaSO4 -	8.973E-05	7.897E-05	-4.10254	0.88006	0.755
5005800	NaHPO4 -	7.921E-10	6.971E-10	-9.15673	0.88006	12.691
5002700	NaF AQ	1.169E-10	1.174E-10	-9.93050	1.00370	-0.792
4107320	KSO4 -	3.803E-06	3.347E-06	-5.47539	0.88006	0.902
4105800	KHPO4 -	2.416E-11	2.126E-11	-10.67238	0.88006	12.695
2803300	FeOH +	9.390E-08	8.264E-08	-7.08283	0.88006	-9.445
2803301	FeOH3 -1	2.766E-12	2.434E-12	-11.61369	0.88006	-30.945
2807320	FeSO4 AQ	2.706E-07	2.716E-07	-6.56608	1.00370	2.248
2805800	FeH2PO4 +	1.041E-12	9.162E-13	-12.03800	0.88006	22.308
2803302	FeOH2 AQ	2.139E-10	2.147E-10	-9.66826	1.00370	-20.572
2805801	FeHPO4 AQ	1.387E-10	1.392E-10	-9.85627	1.00370	15.948
2813300	FeOH +2	1.144E-21	6.865E-22	-21.16339	0.59987	-1.968
2815800	FeHPO4 +	4.352E-30	3.830E-30	-29.41683	0.88006	17.835
2817320	FeSO4 +	5.873E-27	5.168E-27	-26.28664	0.88006	3.975
2811800	FeCl +2	7.059E-29	4.235E-29	-28.37318	0.59987	1.702
2811801	FeCl2 +	8.651E-31	7.614E-31	-30.11841	0.88006	2.185
2811802	FeCl3 AQ	3.053E-34	3.065E-34	-33.51363	1.00370	1.128
2813301	FeOH2 +	7.883E-17	6.937E-17	-16.15882	0.88006	-5.615
2813302	FeOH3 AQ	2.478E-16	2.487E-16	-15.60425	1.00370	-13.602
2813303	FeOH4 -	8.626E-16	7.591E-16	-15.11968	0.88006	-21.545
2815801	FeH2PO4 +2	3.314E-31	1.988E-31	-30.70157	0.59987	25.202
2812700	FeF +2	7.522E-29	4.512E-29	-28.34560	0.59987	6.421
2812701	FeF2 +	1.676E-31	1.475E-31	-30.83124	0.88006	10.855

2812702	FeF3 Aq	1.908E-35	1.915E-35	-34.71788	1.00370	13.998
2817321	Fe(SO4)2 -	3.313E-28	2.915E-28	-27.53532	0.88006	5.475
2813304	Fe2(OH)2+4	9.795E-41	1.268E-41	-40.89678	0.12948	-2.062
2813305	Fe3(OH)4+5	4.483E-54	1.838E-55	-54.73560	0.04101	-4.913
4407320	LiSO4 -	7.801E-08	6.865E-08	-7.16334	0.88006	0.695
8003300	SrOH +	2.050E-10	1.805E-10	-9.74364	0.88006	-13.123
1003300	BaOH +	1.994E-12	1.755E-12	-11.75566	0.88006	-13.303
3301400	HCO3 -	1.620E-03	1.426E-03	-2.84587	0.88006	10.385
3301401	H2CO3 Aq	1.045E-05	1.049E-05	-4.97917	1.00370	16.679
3307320	HSO4 -	6.444E-10	5.671E-10	-9.24636	0.88006	2.043
3302700	HF Aq	3.945E-13	3.959E-13	-12.40238	1.00370	3.167
3302701	HF2 -	1.401E-19	1.233E-19	-18.90902	0.88006	3.804
3302702	H2F2 Aq	4.204E-25	4.219E-25	-24.37476	1.00370	6.766
3305800	HPO4 -2	6.746E-08	4.047E-08	-7.39287	0.59987	12.568

Type III - SPECIES WITH FIXED ACTIVITY

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
2	H2O	-8.113E-04	-3.091	0.000	0.000
7015003	HYDRAPATITE	-2.709E-05	-4.567	44.199	0.000
3301403	CO2 (g)	-8.212E-04	-3.086	21.660	-0.530
5015001	CALCITE	1.117E-03	-2.952	8.475	2.585
3028100	HEMATITE	4.481E-06	-5.349	4.008	30.845
2802810	Fe+2/Fe+3	-4.048E-12	-11.393	13.032	-10.000
7015002	FCO3APATITE	1.698E-05	-4.770	114.400	-39.390

Type V - POSSIBLE SOLIDS

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
4210000	BAF2	5.064E-16	-15.296	5.760	-1.000
5015000	ARAGONITE	7.263E-01	-0.139	8.336	2.615
6080000	CELESTITE	4.636E-02	-1.334	6.465	0.470
3028102	LEPIDOCROCIT	4.216E-04	-3.375	-1.371	0.000
6046000	EPSOMITE	8.020E-05	-4.096	2.140	-2.820
2028100	FERRIHYDRITE	1.273E-07	-6.895	-4.891	0.000
2028101	FE3(OH)8	4.691E-14	-13.329	-20.222	0.000
4128100	FE(OH)2.7CL.3	5.913E-03	-2.228	3.040	0.000
6028100	FE2(SO4)3	0.000E-01	-66.742	-3.580	59.120
2046000	BRUCITE	4.911E-04	-3.309	-16.792	25.840
6010000	BARITE	2.214E+00	0.345	9.976	-6.280
4215000	FLUORITE	9.802E-08	-7.009	10.949	-4.710
2028102	GOETHITE	3.133E-03	-2.504	-0.500	14.480
6015001	GYPSUM	2.064E-02	-1.685	4.848	-0.261
4150000	HALITE	9.309E-07	-6.031	-1.582	-0.918
5046000	ARTINITE	5.082E-05	-4.294	-9.600	28.742
5015003	HUNTITE	9.186E-04	-3.037	29.968	25.760
5046001	HYDRMAGNESIT	3.483E-11	-10.458	8.766	52.210
6050000	JAROSITE NA	1.522E-28	-27.818	11.200	36.180
6041002	JAROSITE K	1.831E-26	-25.737	14.800	31.280
6028101	JAROSITE H	4.480E-34	-33.349	12.100	55.150
3028101	MAGHEMITE	4.036E-11	-10.394	-6.386	0.000
5046002	MAGNESITE	7.118E-01	-0.148	8.029	6.169
6015000	ANHYDRITE	1.271E-02	-1.896	4.637	3.769
6028000	MELANTERITE	4.495E-07	-6.347	2.470	-2.860
6050001	MIRABILITE	1.803E-06	-5.744	1.114	-18.987
3050000	NATRON	3.243E-08	-7.489	1.311	-15.745
5046003	NESQUEHONITE	2.779E-03	-2.556	5.621	5.789
5028000	SIOERITE	6.193E-01	-0.208	10.550	5.328
4280000	SRF2	2.073E-11	-10.683	8.540	-1.250
7028100	STRENGITE	4.871E-13	-12.312	26.400	2.030
5080000	STRONTIANITE	3.229E-01	-0.491	9.250	0.690
6050002	THENAROLITE	2.102E-07	-6.677	0.179	0.572
5050001	THERMONATR	1.192E-09	-8.924	-0.125	2.802
7028001	VIVIANITE	1.942E-05	-4.712	36.000	0.000
5010000	WITHERITE	1.028E-03	-2.988	8.585	-0.360
2047000	PYROLUSITE	1.420E+04	4.152	-15.861	29.180
2047001	BIRNESSITE	8.362E+01	1.922	-18.091	0.000
2047002	NSUTITE	3.231E+02	2.509	-17.504	0.000
3047100	BIXBYITE	0.000E-01	40.385	0.611	15.245
2047100	MANGANITE	1.334E+20	20.125	0.238	0.000
6047100	MN2(SO4)3	2.145E-14	-13.669	5.711	39.060

2015000	LIME	2.444E-20	-19.612	-32.797	46.265
2015001	PORTLANDITE	3.235E-10	-9.490	-22.675	30.690
2028000	WUSTITE	3.439E-01	-0.464	-11.687	24.846
2046001	PERICLASE	9.405E-09	-8.027	-21.510	36.135
3046001	MAG-FERRITE	5.133E-08	-7.290	-16.765	66.639

Type VI - EXCLUDED SPECIES (not included in mole balance)

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
5015002	DOLOMITE	2.231E+00	0.348	17.000	8.290
3028000	MAGNETITE	1.435E+03	3.157	-3.737	50.460
1	E-1	2.283E+08	8.359	0.000	0.000
3301404	CH4 (g)	2.697E+17	17.431	40.100	-61.000
3300021	O2 (g)	0.000E-01	-82.616	-83.120	133.830

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	1.3	98.7	PERCENT BOUND IN SPECIES #330140D	HCO3 -
			PERCENT BOUND IN SPECIES #3301401 H2CO3 AQ	
SO4-2	3.2	92.1	PERCENT BOUND IN SPECIES # 732	SO4-2
	1.8		PERCENT BOUND IN SPECIES #4607320 MgSO4 AQ	
	2.8		PERCENT BOUND IN SPECIES #1507320 CaSO4 AQ	
			PERCENT BOUND IN SPECIES #5007320 NaSO4 -	
Ba+2		100.0	PERCENT BOUND IN SPECIES # 100	Ba+2
Be+2		100.0	PERCENT BOUND IN SPECIES # 110	Be+2
H3BO3	16.7	83.3	PERCENT BOUND IN SPECIES # 90	H3BO3
			PERCENT BOUND IN SPECIES #3300900 H2BO3 -1	
E-1		100.0	PERCENT BOUND IN SPECIES # 180	Cl-1
Cl-1				
F-1	2.1	97.6	PERCENT BOUND IN SPECIES # 270	F-1
			PERCENT BOUND IN SPECIES #4602700 MgF +	
Li+1		99.2	PERCENT BOUND IN SPECIES # 440	Li+1
Mg+2	15.6	82.4	PERCENT BOUND IN SPECIES # 460	Mg+2
			PERCENT BOUND IN SPECIES #4607320 MgSO4 AQ	
Mn+3		100.0	PERCENT BOUND IN SPECIES # 471	Mn+3
NO3-1		100.0	PERCENT BOUND IN SPECIES # 492	NO3-1
Sr+2		100.0	PERCENT BOUND IN SPECIES # 800	Sr+2
K+1	1.2	98.8	PERCENT BOUND IN SPECIES # 410	K+1
			PERCENT BOUND IN SPECIES #4107320 KSO4 -	
CO3-2	95.6	2.0	PERCENT BOUND IN SPECIES # 140	CO3-2
			PERCENT BOUND IN SPECIES #3301400 HCO3 -	
PO4-3	8.4	2.5	PERCENT BOUND IN SPECIES #3305801	H2PO4 -
	10.3		PERCENT BOUND IN SPECIES #4605800 MgPO4 -	
	3.8		PERCENT BOUND IN SPECIES #4605802 MgHPO4 AQ	
	3.1		PERCENT BOUND IN SPECIES #1505800 CaHPO4 AQ	
	70.7		PERCENT BOUND IN SPECIES #1505801 CaPO4 -	
			PERCENT BOUND IN SPECIES #3305800 HPO4 -2	
H2O	4.9	92.2	PERCENT BOUND IN SPECIES #3300020	OH-
	2.5		PERCENT BOUND IN SPECIES #4603300 MgOH +	
			PERCENT BOUND IN SPECIES #2803300 FeOH +	
Ca+2	1.4	80.3	PERCENT BOUND IN SPECIES # 150	Ca+2
	17.4		PERCENT BOUND IN SPECIES #1501401 CaCO3 AQ	
			PERCENT BOUND IN SPECIES #1507320 CaSO4 AQ	
Fe+2	5.2	79.6	PERCENT BOUND IN SPECIES # 280	Fe+2
	15.1		PERCENT BOUND IN SPECIES #2803300 FeOH +	
			PERCENT BOUND IN SPECIES #2807320 FeSO4 AQ	
Fe+3	20.8	6.6	PERCENT BOUND IN SPECIES #2813301	FeOH2 +
	72.5		PERCENT BOUND IN SPECIES #2813302 FeOH3 AQ	
			PERCENT BOUND IN SPECIES #2813303 FeOH4 -	
Na+1		99.0	PERCENT BOUND IN SPECIES # 500	Na+1

PART 5 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:19:47

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.642E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	3.230E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	2.186E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
110	Be+2	1.111E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	6.855E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
1	E-1	0.000E-01	0.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	4.574E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	9.534E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
440	Li+1	1.010E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	6.604E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	8.563E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
492	NO3-1	4.289E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.485E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
410	K+1	3.072E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.696E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	9.540E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	3.779E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	3.410E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
280	Fe+2	1.792E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
281	Fe+3	1.189E-15	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	1.014E-02	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 1.206E-02 Sum of ANIONS 1.233E-02

PERCENT DIFFERENCE = 1.106E+00 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 1.606E-02

PART 6 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:19:47

Saturation indices and stoichiometry of all supersaturated minerals

ID #	NAME	Sat. Index	Stoichiometry in [brackets]					
6010000	BARITE	0.345	[1.000]	100	[1.000]	732		
5015001	CALCITE	0.000	[1.000]	150	[1.000]	140		
5015002	DOLOMITE	0.348	[1.000]	150	[1.000]	460	[2.000]	140
7015003	HYDRAPATITE	0.000	[5.000]	150	[3.000]	580	[1.000]	2
			[-1.000]	330				
7015002	FCO3APATITE	0.000	[9.496]	150	[0.360]	500	[0.144]	460
			[4.800]	580	[1.200]	140	[2.480]	270
3028100	HEMATITE	0.000	[-6.000]	330	[2.000]	281	[3.000]	2
3028000	MAGNETITE	3.157	[-8.000]	330	[2.000]	281	[1.000]	280
			[4.000]	2				
2047000	PYROLUSITE	4.152	[-4.000]	330	[-1.000]	1	[1.000]	471
			[2.000]	2				
2047001	BIRNESSITE	1.922	[-4.000]	330	[-1.000]	1	[1.000]	471
			[2.000]	2				
2047002	NSUTITE	2.509	[-4.000]	330	[-1.000]	1	[1.000]	471
			[2.000]	2				
3047100	BIXBYITE	40.385	[-6.000]	330	[2.000]	471	[3.000]	2
2047100	MANGANITE	20.125	[-3.000]	330	[1.000]	471	[2.000]	2

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:19:48

ITERATIONS= 37: SOLID BIXBYITE PRECIPITATES

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
37	Sr+2	1.485E-05	-5.942E-06	-5.05021	5.941E-06
38	Sr+2	1.485E-05	9.647E-06	-4.82827	9.645E-06
39	Sr+2	1.485E-05	1.881E-07	-5.04566	1.866E-07
40	Sr+2	1.485E-05	-3.726E-08	-5.05112	3.577E-08
41	Sr+2	1.485E-05	-1.783E-09	-5.05003	2.984E-10

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	2.453E-08	3.752E-09	-8.48120	0.880181	4.500E-08
732	SO4-2	3.230E-03	2.972E-03	-2.74861	0.600189	-8.804E-09
100	Ba+2	2.186E-07	2.186E-07	-6.88199	0.600189	-6.432E-13
110	Be+2	1.111E-07	1.111E-07	-7.17614	0.600189	-3.267E-13
90	H3BO3	6.855E-05	5.721E-05	-4.24095	1.003695	-5.478E-12
1	E-1	0.000E-01	2.230E+08	8.34833	0.880181	-4.253E-12
180	Cl-1	4.574E-03	4.574E-03	-2.39517	0.880181	-3.364E-09
270	F-1	4.215E-05	9.239E-08	-7.08979	0.880181	5.119E-08
440	Li+1	1.010E-05	1.002E-05	-5.05460	0.880181	-7.426E-12
460	Mg+2	6.628E-04	5.445E-04	-3.48568	0.600189	1.372E-09
410	K+1	3.072E-04	3.034E-04	-3.57346	0.880181	-2.259E-10
492	NO3-1	4.289E-06	4.289E-06	-5.42306	0.880181	-3.154E-12
800	Sr+2	1.485E-05	1.485E-05	-5.04998	0.600189	-4.369E-11
471	Mn+3	8.563E-06	5.623E-26	-25.74886	0.317064	6.353E-21
580	PO4-3	3.162E-07	1.714E-11	-11.26473	0.317064	-1.522E-21
140	CO3-2	2.012E-03	3.342E-05	-4.69776	0.600189	0.000E-01
500	Na+1	1.014E-02	1.004E-02	-2.05380	0.880181	-3.180E-21
281	Fe+3	8.961E-06	1.126E-27	-27.44736	0.317064	0.000E-01
280	Fe+2	1.792E-06	1.428E-06	-6.06703	0.600189	0.000E-01
150	Ca+2	1.483E-03	2.783E-04	-3.77717	0.600189	1.519E-20
2	H2O	-8.470E-22	-8.046E-04	-0.00017	1.000000	8.470E-22

Type I - COMPONENTS AS SPECIES IN SOLUTION

ID	NAME	CALC MOL	ACTIVITY	LOG ACTVTY	GAMMA	NEW LOGK
330	H+1	3.752E-09	3.302E-09	-8.48120	0.88018	0.055
140	CO3-2	3.342E-05	2.006E-05	-4.69776	0.60019	0.222
100	Ba+2	2.186E-07	1.312E-07	-6.88199	0.60019	0.222
110	Be+2	1.111E-07	6.666E-08	-7.17614	0.60019	0.222
90	H3BO3	5.721E-05	5.742E-05	-4.24095	1.00370	-0.002
150	Ca+2	2.783E-04	1.670E-04	-3.77717	0.60019	0.222
180	Cl-1	4.574E-03	4.026E-03	-2.39517	0.88018	0.055
270	F-1	9.239E-08	8.132E-08	-7.08979	0.88018	0.055
440	Li+1	1.002E-05	8.819E-06	-5.05460	0.88018	0.055
460	Mg+2	5.445E-04	3.268E-04	-3.48568	0.60019	0.222
471	Mn+3	5.623E-26	1.783E-26	-25.74886	0.31706	0.499
492	NO3-1	4.289E-06	3.775E-06	-5.42306	0.88018	0.055
580	PO4-3	1.714E-11	5.436E-12	-11.26473	0.31706	0.499
410	K+1	3.034E-04	2.670E-04	-3.57346	0.88018	0.055
500	Na+1	1.004E-02	8.835E-03	-2.05380	0.88018	0.055
800	Sr+2	1.485E-05	8.913E-06	-5.04998	0.60019	0.222
732	SO4-2	2.972E-03	1.784E-03	-2.74861	0.60019	0.222
280	Fe+2	1.428E-06	8.570E-07	-6.06704	0.60019	0.222
281	Fe+3	1.126E-27	3.570E-28	-27.44736	0.31706	0.499

Type II - OTHER SPECIES IN SOLUTION OR ADSORBED

ID	NAME	CALC MOL	ACTIVITY	LOG ACTVTY	GAMMA	NEW LOGK
3305801	H2PO4 -	2.406E-09	2.118E-09	-8.67414	0.88018	19.608
3305802	H3PO4	9.774E-16	9.810E-16	-15.00834	1.00370	21.698
3300020	OH-	3.455E-06	3.041E-06	-5.51696	0.88018	-13.943
3300900	H2BO3 -1	1.135E-05	9.987E-06	-5.00055	0.88018	-9.185
902700	BF(OH)3 -	2.117E-12	1.863E-12	-11.72974	0.88018	-0.344

902701	BF2(OH)2 -	6.079E-20	5.351E-20	-19.27156	0.88018	7.685
902702	BF3OH -	1.778E-29	1.565E-29	-28.80539	0.88018	13.722
902703	BF4 -	1.933E-38	1.701E-38	-37.76921	0.88018	20.329
4603300	MgOH +	1.848E-07	1.626E-07	-6.78875	0.88018	-11.729
4602700	MgF +	1.995E-09	1.756E-09	-8.75547	0.88018	1.875
4601400	MgCO3 AQ	6.233E-06	6.256E-06	-5.20371	1.00370	2.978
4601401	MgHCO3 +	6.108E-06	5.376E-06	-5.26952	0.88018	11.451
4607320	MgSO4 AQ	1.033E-04	1.037E-04	-3.98429	1.00370	2.248
4605800	MgPO4 -	7.835E-09	6.896E-09	-8.16141	0.88018	6.644
4605801	MgH2PO4 +	2.562E-11	2.255E-11	-10.64682	0.88018	21.121
4605802	MgHPO4 AQ	9.700E-09	9.736E-09	-8.01161	1.00370	15.218
1503300	CaOH +	1.450E-08	1.276E-08	-7.89413	0.88018	-12.543
1501400	CaHCO3 +	2.782E-06	2.449E-06	-5.61104	0.88018	11.401
1501401	CaCO3 AQ	4.743E-06	4.761E-06	-5.32232	1.00370	3.151
1507320	CaSO4 AQ	6.048E-05	6.070E-05	-4.21678	1.00370	2.307
1505800	CaHPO4 AQ	3.633E-09	3.647E-09	-8.43810	1.00370	15.083
1505801	CaPO4 -	2.968E-09	2.613E-09	-8.58290	0.88018	6.514
1505802	CaH2PO4 +	1.026E-11	9.030E-12	-11.04431	0.88018	21.015
1502700	CaF +	1.344E-10	1.183E-10	-9.92696	0.88018	0.995
5001400	NaCO3 -	3.731E-06	3.284E-06	-5.48356	0.88018	1.323
5001401	NaHCO3 AQ	7.008E-06	7.034E-06	-5.15277	1.00370	10.078
5007320	NaSO4 -	8.975E-05	7.899E-05	-4.10240	0.88018	0.755
5005800	NaHPO4 -	7.793E-10	6.859E-10	-9.16373	0.88018	12.691
5002700	NaF AQ	1.161E-10	1.165E-10	-9.93358	1.00370	-0.792
4107320	KSO4 -	3.803E-06	3.348E-06	-5.47526	0.88018	0.902
4105800	KHPO4 -	2.377E-11	2.092E-11	-10.67939	0.88018	12.695
2803300	FeOH +	9.320E-08	8.204E-08	-7.08600	0.88018	-9.445
2803301	FeOH3 -1	2.701E-12	2.377E-12	-11.62392	0.88018	-30.945
2807320	FeSO4 AQ	2.709E-07	2.719E-07	-6.56564	1.00370	2.248
2805800	FeH2PO4 +	1.033E-12	9.096E-13	-12.04117	0.88018	22.308
2803302	FeOH2 AQ	2.106E-10	2.114E-10	-9.67496	1.00370	-20.572
2805801	FeHPO4 AQ	1.366E-10	1.371E-10	-9.86297	1.00370	15.948
2813300	FeOH +2	1.162E-21	6.977E-22	-21.15633	0.60019	-1.968
2815800	FeHPO4 +	4.387E-30	3.861E-30	-29.41330	0.88018	17.835
2817320	FeSO4 +	6.018E-27	5.297E-27	-26.27597	0.88018	3.975
2811800	FeCl +2	7.231E-29	4.340E-29	-28.36253	0.60019	1.702
2811801	FeCl2 +	8.866E-31	7.804E-31	-30.10770	0.88018	2.185
2811802	FeCl3 AQ	3.130E-34	3.142E-34	-33.50286	1.00370	1.128
2813301	FeOH2 +	7.946E-17	6.994E-17	-16.15529	0.88018	-5.615
2813302	FeOH3 AQ	2.478E-16	2.487E-16	-15.60425	1.00370	-13.602
2813303	FeOH4 -	8.555E-16	7.530E-16	-15.12321	0.88018	-21.545
2815801	FeH2PO4 +2	3.367E-31	2.021E-31	-30.69450	0.60019	25.202
2812700	FeF +2	7.648E-29	4.590E-29	-28.33815	0.60019	6.421
2812701	FeF2 +	1.692E-31	1.490E-31	-30.82694	0.88018	10.855
2812702	FeF3 AQ	1.913E-35	1.920E-35	-34.71673	1.00370	13.998
2817321	Fe(SO4)2 -	3.395E-28	2.988E-28	-27.52458	0.88018	5.475
2813304	Fe2(OH)2+4	1.010E-40	1.310E-41	-40.88265	0.12976	-2.063
2813305	Fe3(OH)4+5	4.653E-54	1.915E-55	-54.71794	0.04114	-4.914
4407320	LiSO4 -	7.802E-08	6.867E-08	-7.16320	0.88018	0.695
8003300	SiOH +	2.035E-10	1.791E-10	-9.74694	0.88018	-13.123
1003300	BaOH +	1.979E-12	1.742E-12	-11.75896	0.88018	-13.303
3301400	HCO3 -	1.607E-03	1.414E-03	-2.84940	0.88018	10.385
3301401	H2CO3 AQ	1.045E-05	1.049E-05	-4.97917	1.00370	16.679
3307320	HSO4 -	6.496E-10	5.718E-10	-9.24275	0.88018	2.042
3302700	HF AQ	3.948E-13	3.963E-13	-12.40199	1.00370	3.167
3302701	HF2 -	1.392E-19	1.225E-19	-18.91178	0.88018	3.804
3302702	H2F2 AQ	4.211E-25	4.227E-25	-24.37398	1.00370	6.766
3305800	HPO4 -2	6.634E-08	3.982E-08	-7.39994	0.60019	12.568

Type III - SPECIES WITH FIXED ACTIVITY

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
2	H2O	-8.046E-04	-3.094	0.000	0.000
7015003	HYORAPATITE	-2.709E-05	-4.567	44.199	0.000
3301403	CO2 (g)	-8.016E-04	-3.096	21.660	-0.530
5015001	CALCITE	1.111E-03	-2.954	8.475	2.585
3028100	HEMATITE	4.481E-06	-5.349	4.008	30.845
2802810	Fe+2/Fe+3	-4.253E-12	-11.371	13.032	-10.000
7015002	FCO3APATITE	1.698E-05	-4.770	114.400	-39.390

Type IV - FINITE SOLIUS (presumed present at equilibrium)

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
3047100	BIXBYITE	4.281E-06	-5.368	0.611	15.245

Type V - POSSIBLE SOLIDS

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
5015000	ARAGONITE	7.263E-01	-0.139	8.336	2.615
6080000	CELESTITE	4.639E-02	-1.334	6.465	0.470
3028102	LEPIDOCROCIT	4.216E-04	-3.375	-1.371	0.000
6046000	EPSOMITE	8.027E-05	-4.095	2.140	-2.820
2028100	FERRIHYDRITE	1.273E-07	-6.895	-4.891	0.000
2028101	FE3(OH)8	4.619E-14	-13.335	-20.222	0.000
4128100	FE(OH)2.7CL.3	5.928E-03	-2.227	3.040	0.000
6028100	FE2(SO4)3	0.000E-01	-66.721	-3.580	59.120
2046000	BRUCITE	4.835E-04	-3.316	-16.792	25.840
6010000	BARITE	2.215E+00	0.345	9.976	-6.280
4215000	FLUORITE	9.819E-08	-7.008	10.949	-4.710
2028102	GOETHITE	3.133E-03	-2.504	-0.500	14.480
6015001	GYPSUM	2.098E-02	-1.678	4.848	-0.261
4150000	HALITE	9.312E-07	-6.031	-1.582	-0.918
5046000	ARTINITE	4.926E-05	-4.308	-9.600	28.742
5015003	HUNTITE	8.765E-04	-3.057	29.968	25.760
5046001	HYDRMAGNESIT	3.221E-11	-10.492	8.766	52.210
6050000	JAROSITE NA	1.560E-28	-27.807	11.200	36.180
6041002	JAROSITE K	1.877E-26	-25.727	14.800	31.280
6028101	JAROSITE H	4.630E-34	-33.334	12.100	55.150
3028101	MAGHEMITE	4.036E-11	-10.394	-6.386	0.000
5046002	MAGNESITE	7.008E-01	-0.154	8.029	6.169
6015000	ANHYDRITE	1.292E-02	-1.889	4.637	3.769
6028000	MELANTERITE	4.500E-07	-6.347	2.470	-2.860
6050001	MIRABILITE	1.804E-06	-5.744	1.114	-18.987
3050000	NATRON	3.191E-08	-7.496	1.311	-15.745
5046003	NESQUEHONITE	2.736E-03	-2.563	5.621	5.789
5028000	SIDERITE	6.098E-01	-0.215	10.550	5.328
4280000	SRF2	2.044E-11	-10.690	8.540	-1.250
7028100	STRENGITE	4.871E-13	-12.312	26.400	2.030
5080000	STRONTIANITE	3.179E-01	-0.498	9.250	0.690
6050002	THENARDITE	2.103E-07	-6.677	0.179	0.572
5050001	THERMONATR	1.173E-09	-8.931	-0.125	2.802
7028001	VIVIANITE	1.854E-05	-4.732	36.000	0.000
5010000	WITHERITE	1.012E-03	-2.995	8.585	-0.360
2047000	PYROLUSITE	9.253E-17	-16.034	-15.861	29.180
2047001	BIRNESSITE	5.449E-19	-18.264	-18.091	0.000
2047002	NSUTITE	2.105E-18	-17.677	-17.504	0.000
4210000	BAF2	4.994E-16	-15.302	5.760	-1.000
2047100	MANGANITE	8.559E-01	-0.068	0.238	0.000
6047100	MN2(SO4)3	0.000E-01	-54.033	5.711	39.060
2015000	LIME	2.444E-20	-19.612	-32.797	46.265
2015001	PORTLANDITE	3.235E-10	-9.490	-22.675	30.690
2028000	WUSTITE	3.387E-01	-0.470	-11.687	24.846
2046001	PERICLASE	9.259E-09	-8.033	-21.510	36.135
3046001	MAG-FERRITE	5.053E-08	-7.296	-16.765	66.639

Type VI - EXCLUDED SPECIES (not included in mole balance)

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
5015002	DOLOMITE	2.196E+00	0.342	17.000	8.290
3028000	MAGNETITE	1.413E+03	3.150	-3.737	50.460
1	E-1	2.230E+08	8.348	0.000	0.000
3301404	CH4 (g)	2.384E+17	17.377	40.100	-61.000
3300021	O2 (g)	0.000E-01	-82.589	-83.120	133.830

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	1.3	98.7	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401 H2CO3 AQ	
SO4-2	3.2	92.0	PERCENT BOUND IN SPECIES # 732	SO4-2
	1.9		PERCENT BOUND IN SPECIES #4607320 MgSO4 AQ	
	2.8		PERCENT BOUND IN SPECIES #1507320 CaSO4 AQ	
			PERCENT BOUND IN SPECIES #5007320 NaSO4 -	
Ba+2		100.0	PERCENT BOUND IN SPECIES # 100	Ba+2
Be+2		100.0	PERCENT BOUND IN SPECIES # 110	Be+2
H3BO3	16.6	83.4	PERCENT BOUND IN SPECIES # 90	H3BO3
			PERCENT BOUND IN SPECIES #3300900 H2BO3 -1	
E-1				
Cl-1		100.0	PERCENT BOUND IN SPECIES # 180	Cl-1
F-1	2.1	97.6	PERCENT BOUND IN SPECIES # 270	F-1
			PERCENT BOUND IN SPECIES #4602700 MgF +	
Li+1		99.2	PERCENT BOUND IN SPECIES # 440	Li+1
Mg+2	15.6	82.5	PERCENT BOUND IN SPECIES # 460	Mg+2
			PERCENT BOUND IN SPECIES #4607320 MgSO4 AQ	
K+1	1.2	98.8	PERCENT BOUND IN SPECIES # 410	K+1
			PERCENT BOUND IN SPECIES #4107320 KSO4 -	
NO3-1		100.0	PERCENT BOUND IN SPECIES # 492	NO3-1
Sr+2		100.0	PERCENT BOUND IN SPECIES # 800	Sr+2
Mn+3		100.0	PERCENT BOUND IN SPECIES # 471	Mn+3
PO4-3	8.3	2.6	PERCENT BOUND IN SPECIES #3305801	H2PO4 -
	10.3		PERCENT BOUND IN SPECIES #4605800 MgPO4 -	
	3.9		PERCENT BOUND IN SPECIES #4605802 MgHPO4 AQ	
	3.2		PERCENT BOUND IN SPECIES #1505800 CaHPO4 AQ	
	70.7		PERCENT BOUND IN SPECIES #1505801 CaPO4 -	
			PERCENT BOUND IN SPECIES #3305800 HPO4 -2	
CO3-2	95.6	2.0	PERCENT BOUND IN SPECIES # 140	CO3-2
			PERCENT BOUND IN SPECIES #3301400 HCO3 -	
Na+1		99.0	PERCENT BOUND IN SPECIES # 500	Na+1
Fe+3	21.0	6.7	PERCENT BOUND IN SPECIES #2813301	FeOH2 +
	72.3		PERCENT BOUND IN SPECIES #2813302 FeOH3 AQ	
			PERCENT BOUND IN SPECIES #2813303 FeOH4 -	
Fe+2	5.2	79.7	PERCENT BOUND IN SPECIES # 280	Fe+2
	15.1		PERCENT BOUND IN SPECIES #2803300 FeOH +	
			PERCENT BOUND IN SPECIES #2807320 FeSO4 AQ	
Ca+2	1.4	80.4	PERCENT BOUND IN SPECIES # 150	Ca+2
	17.5		PERCENT BOUND IN SPECIES #1501401 CaCO3 AQ	
			PERCENT BOUND IN SPECIES #1507320 CaSO4 AQ	
H2O	4.9	92.2	PERCENT BOUND IN SPECIES #3300020	OH-
	2.5		PERCENT BOUND IN SPECIES #4603300 MgOH +	
			PERCENT BOUND IN SPECIES #2803300 FeOH +	

 ----- PROVISIONAL MASS DISTRIBUTION -----

IOX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.629E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	3.230E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	2.186E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
110	Be+2	1.111E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	6.855E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
1	E-1	0.000E-01	0.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	4.574E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	9.464E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
440	Li+1	1.010E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	6.604E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
410	K+1	3.072E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
492	NO3-1	4.289E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.485E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	5.623E-26	0.0	0.000E-01	0.0	8.563E-06	100.0
580	PO4-3	9.388E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.682E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	1.014E-02	100.0	0.000E-01	0.0	0.000E-01	0.0
281	Fe+3	1.183E-15	100.0	0.000E-01	0.0	0.000E-01	0.0
280	Fe+2	1.792E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	3.463E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	3.748E-06	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 1.204E-02 Sum of ANIONS 1.231E-02

PERCENT DIFFERENCE = 1.108E+00 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 1.602E-02

PART 6 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:19:49

Saturation indices and stoichiometry of all supersaturated minerals

ID #	NAME	Sat. Index	Stoichiometry in [brackets]			
6010000	BARITE	0.345	[1.000]	100	[1.000]	732
5015001	CALCITE	0.000	[1.000]	150	[1.000]	140
5015002	DOLOMITE	0.342	[1.000]	150	[1.000]	460 [2.000] 140
7015002	FCO3APATITE	0.000	[9.496]	150	[0.360]	500 [0.144] 460
			[4.800]	580	[1.200]	140 [2.480] 270
3028100	HEMATITE	0.000	[-6.000]	330	[2.000]	281 [3.000] 2
3028000	MAGNETITE	3.150	[-8.000]	330	[2.000]	281 [1.000] 280
			[4.000]	2		
3047100	BIXBYITE	0.000	[-6.000]	330	[2.000]	471 [3.000] 2

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:19:49

ITERATIONS= 42: SOLID BARITE PRECIPITATES

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
42	NO3-1	4.289E-06	-5.139E-07	-5.42306	5.135E-07
43	NO3-1	4.289E-06	5.717E-07	-5.36763	5.712E-07
44	NO3-1	4.289E-06	1.355E-08	-5.42198	1.312E-08
45	NO3-1	4.289E-06	-2.690E-09	-5.42335	2.262E-09
46	Be+2	1.111E-07	-1.334E-11	-7.17619	2.229E-12

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	2.453E-08	3.752E-09	-8.48120	0.880182	4.500E-08
732	SO4-2	3.230E-03	2.972E-03	-2.74862	0.600192	-8.804E-09
800	Sr+2	1.485E-05	1.485E-05	-5.04998	0.600192	-4.369E-11
110	Be+2	1.111E-07	1.111E-07	-7.17614	0.600192	-3.268E-13
90	H3BO3	6.855E-05	5.721E-05	-4.24095	1.003695	-5.479E-12
1	E-1	0.000E-01	2.230E+08	8.34833	0.880182	-4.254E-12
180	Cl-1	4.574E-03	4.574E-03	-2.39517	0.880182	-3.364E-09
270	F-1	4.215E-05	9.239E-08	-7.08979	0.880182	5.120E-08
440	Li+1	1.010E-05	1.002E-05	-5.05460	0.880182	-7.427E-12
460	Mg+2	6.628E-04	5.445E-04	-3.48568	0.600192	1.372E-09
410	K+1	3.072E-04	3.034E-04	-3.57346	0.880182	-2.259E-10
492	NO3-1	4.289E-06	4.289E-06	-5.42306	0.880182	-3.155E-12
2	H2O	-1.301E-17	-8.046E-04	-0.00017	1.000000	0.000E-01
580	PO4-3	3.162E-07	1.714E-11	-11.26473	0.317069	-3.388E-21
150	Ca+2	1.483E-03	2.783E-04	-3.77717	0.600192	0.000E-01
140	CO3-2	2.012E-03	3.342E-05	-4.69776	0.600192	0.000E-01
280	Fe+2	1.792E-06	1.428E-06	-6.06703	0.600192	0.000E-01
281	Fe+3	8.961E-06	1.126E-27	-27.44736	0.317069	0.000E-01
500	Na+1	1.014E-02	1.004E-02	-2.05379	0.880182	3.251E-22
471	Mn+3	8.563E-06	5.623E-26	-25.74886	0.317069	0.000E-01
100	Ba+2	2.186E-07	9.870E-08	-7.22738	0.600192	0.000E-01

Type I - COMPONENTS AS SPECIES IN SOLUTION

ID	NAME	CALC MOL	ACTIVITY	LOG ACTVTY	GAMMA	NEW LOGK
330	H+1	3.752E-09	3.302E-09	-8.48120	0.88018	0.055
140	CO3-2	3.342E-05	2.006E-05	-4.69776	0.60019	0.222
100	Ba+2	9.870E-08	5.924E-08	-7.22738	0.60019	0.222
110	Be+2	1.111E-07	6.666E-08	-7.17614	0.60019	0.222
90	H3BO3	5.721E-05	5.742E-05	-4.24095	1.00370	-0.002
150	Ca+2	2.783E-04	1.670E-04	-3.77717	0.60019	0.222
180	Cl-1	4.574E-03	4.026E-03	-2.39517	0.88018	0.055
270	F-1	9.239E-08	8.132E-08	-7.08979	0.88018	0.055
440	Li+1	1.002E-05	8.819E-06	-5.05460	0.88018	0.055
460	Mg+2	5.445E-04	3.268E-04	-3.48568	0.60019	0.222
471	Mn+3	5.623E-26	1.783E-26	-25.74886	0.31707	0.499
492	NO3-1	4.289E-06	3.775E-06	-5.42306	0.88018	0.055
580	PO4-3	1.714E-11	5.436E-12	-11.26473	0.31707	0.499
410	K+1	3.034E-04	2.670E-04	-3.57346	0.88018	0.055
500	Na+1	1.004E-02	8.835E-03	-2.05379	0.88018	0.055
800	Sr+2	1.485E-05	8.913E-06	-5.04998	0.60019	0.222
732	SO4-2	2.972E-03	1.784E-03	-2.74862	0.60019	0.222
280	Fe+2	1.428E-06	8.570E-07	-6.06703	0.60019	0.222
281	Fe+3	1.126E-27	3.570E-28	-27.44736	0.31707	0.499

Type II - OTHER SPECIES IN SOLUTION OR ADSORBED

ID	NAME	CALC MOL	ACTIVITY	LOG ACTVTY	GAMMA	NEW LOGK
3305801	H2PO4 -	2.406E-09	2.118E-09	-8.67414	0.88018	19.608
3305802	H3PO4	9.774E-16	9.810E-16	-15.00834	1.00370	21.698
3300020	OH-	3.455E-06	3.041E-06	-5.51696	0.88018	-13.943
3300900	H2BO3 -1	1.135E-05	9.987E-06	-5.00055	0.88018	-9.185
902700	BF(OH)3 -	2.117E-12	1.863E-12	-11.72974	0.88018	-0.344

902701	BF2(OH)2 -	6.079E-20	5.351E-20	-19.27157	0.88018	7.685
902702	BF3OH -	1.778E-29	1.565E-29	-28.80539	0.88018	13.722
902703	BF4 -	1.933E-38	1.701E-38	-37.76922	0.88018	20.329
4603300	MgOH +	1.848E-07	1.626E-07	-6.78875	0.88018	-11.729
4602700	MgF +	1.995E-09	1.756E-09	-8.75547	0.88018	1.875
4601400	MgCO3 AQ	6.233E-06	6.256E-06	-5.20371	1.00370	2.978
4601401	MgHCO3 +	6.108E-06	5.376E-06	-5.26952	0.88018	11.451
4607320	MgSO4 AQ	1.033E-04	1.037E-04	-3.98430	1.00370	2.248
4605800	MgPO4 -	7.835E-09	6.896E-09	-8.16141	0.88018	6.644
4605801	MgH2PO4 +	2.562E-11	2.255E-11	-10.64681	0.88018	21.121
4605802	MgHPO4 AQ	9.700E-09	9.736E-09	-8.01161	1.00370	15.218
1503300	CaOH +	1.450E-08	1.276E-08	-7.89413	0.88018	-12.543
1501400	CaHCO3 +	2.782E-06	2.449E-06	-5.61104	0.88018	11.401
1501401	CaCO3 AQ	4.743E-06	4.761E-06	-5.32232	1.00370	3.151
1507320	CaSO4 AQ	6.048E-05	6.070E-05	-4.21679	1.00370	2.307
1505800	CaHPO4 AQ	3.633E-09	3.647E-09	-8.43810	1.00370	15.083
1505801	CaPO4 -	2.968E-09	2.613E-09	-8.58290	0.88018	6.514
1505802	CaH2PO4 +	1.026E-11	9.030E-12	-11.04431	0.88018	21.015
1502700	CaF +	1.344E-10	1.183E-10	-9.92696	0.88018	0.995
5001400	NaCO3 -	3.731E-06	3.284E-06	-5.48354	0.88018	1.323
5001401	NaHCO3 AQ	7.009E-06	7.035E-06	-5.15275	1.00370	10.078
5007320	NaSO4 -	8.975E-05	7.899E-05	-4.10242	0.88018	0.755
5005800	NaHPO4 -	7.793E-10	6.859E-10	-9.16373	0.88018	12.691
5002700	NaF AQ	1.161E-10	1.165E-10	-9.93358	1.00370	-0.792
4107320	KS04 -	3.803E-06	3.348E-06	-5.47527	0.88018	0.902
4105800	KHPO4 -	2.377E-11	2.092E-11	-10.67939	0.88018	12.695
2803300	FeOH +	9.320E-08	8.204E-08	-7.08599	0.88018	-9.445
2803301	FeOH3 -1	2.701E-12	2.377E-12	-11.62392	0.88018	-30.945
2807320	FeSO4 AQ	2.709E-07	2.719E-07	-6.56565	1.00370	2.248
2805800	FeH2PO4 +	1.033E-12	9.096E-13	-12.04117	0.88018	22.308
2803302	FeOH2 AQ	2.106E-10	2.114E-10	-9.67496	1.00370	-20.572
2805801	FeHPO4 AQ	1.366E-10	1.371E-10	-9.86297	1.00370	15.948
2813300	FeOH +2	1.162E-21	6.977E-22	-21.15632	0.60019	-1.968
2815800	FeHPO4 +	4.387E-30	3.861E-30	-29.41330	0.88018	17.835
2817320	FeSO4 +	6.018E-27	5.297E-27	-26.27598	0.88018	3.975
2811800	FeCl +2	7.231E-29	4.340E-29	-28.36253	0.60019	1.702
2811801	FeCl2 +	8.866E-31	7.804E-31	-30.10769	0.88018	2.185
2811802	FeCl3 AQ	3.130E-34	3.142E-34	-33.50286	1.00370	1.128
2813301	FeOH2 +	7.946E-17	6.994E-17	-16.15529	0.88018	-5.615
2813302	FeOH3 AQ	2.478E-16	2.487E-16	-15.60425	1.00370	-13.602
2813303	FeOH4 -	8.555E-16	7.530E-16	-15.12321	0.88018	-21.545
2815801	FeH2PO4 +2	3.367E-31	2.021E-31	-30.69450	0.60019	25.202
2812700	FeF +2	7.648E-29	4.590E-29	-28.33815	0.60019	6.421
2812701	FeF2 +	1.692E-31	1.490E-31	-30.82694	0.88018	10.855
2812702	FeF3 AQ	1.913E-35	1.920E-35	-34.71673	1.00370	13.998
2817321	Fe(SO4)2 -	3.395E-28	2.988E-28	-27.52461	0.88018	5.475
2813304	Fe2(OH)2+4	1.010E-40	1.310E-41	-40.88265	0.12977	-2.063
2813305	Fe3(OH)4+5	4.653E-54	1.915E-55	-54.71794	0.04114	-4.914
4407320	LiSO4 -	7.802E-08	6.867E-08	-7.16322	0.88018	0.695
8003300	SrOH +	2.035E-10	1.791E-10	-9.74694	0.88018	-13.123
1003300	BaOH +	8.935E-13	7.864E-13	-12.10434	0.88018	-13.303
3301400	HCO3 -	1.607E-03	1.414E-03	-2.84940	0.88018	10.385
3301401	H2CO3 AQ	1.045E-05	1.049E-05	-4.97917	1.00370	16.679
3307320	HSO4 -	6.496E-10	5.718E-10	-9.24276	0.88018	2.042
3302700	HF AQ	3.948E-13	3.963E-13	-12.40199	1.00370	3.167
3302701	HF2 -	1.392E-19	1.225E-19	-18.91179	0.88018	3.804
3302702	H2F2 AQ	4.211E-25	4.227E-25	-24.37399	1.00370	6.766
3305800	HPO4 -2	6.634E-08	3.982E-08	-7.39994	0.60019	12.568

Type III - SPECIES WITH FIXED ACTIVITY

IO	NAME	CALC MOL	LOG MOL	NEW LOGK	OH
2	H2O	-8.046E-04	-3.094	0.000	0.000
7015003	HYDRAPATITE	-2.709E-05	-4.567	44.199	0.000
3301403	CO2 (g)	-8.016E-04	-3.096	21.660	-0.530
5015001	CALCITE	1.111E-03	-2.954	8.475	2.585
3028100	HEMATITE	4.481E-06	-5.349	4.008	30.845
2802810	Fe+2/Fe+3	-4.254E-12	-11.371	13.032	-10.000
7015002	FCO3APATITE	1.698E-05	-4.770	114.400	-39.390

Type IV - FINITE SOLIOS (present at equilibrium)

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
3047100	BIXBYITE	4.281E-06	-5.368	0.611	15.245
6010000	BARITE	1.199E-07	-6.921	9.976	-6.280

Type V - UNDERSATURATED SOLIDS (not present at equilibrium)

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
6080000	CELESTITE	4.639E-02	-1.334	6.465	0.470
3028102	LEPIDOCROCIT	4.216E-04	-3.375	-1.371	0.000
6046000	EPSOMITE	8.027E-05	-4.095	2.140	-2.820
2028100	FERRIHYDRITE	1.273E-07	-6.895	-4.891	0.000
2028101	FE3(OH)8	4.619E-14	-13.335	-20.222	0.000
4128100	FE(OH)2.7CL.3	5.928E-03	-2.227	3.040	0.000
6028100	FE2(SO4)3	0.000E-01	-66.721	-3.580	59.120
2046000	BRUCITE	4.835E-04	-3.316	-16.792	25.840
5015000	ARAGONITE	7.263E-01	-0.139	8.336	2.615
4215000	FLUORITE	9.819E-08	-7.008	10.949	-4.710
2028102	GOETHITE	3.133E-03	-2.504	-0.500	14.480
6015001	GYPSUM	2.098E-02	-1.678	4.848	-0.261
4150000	HALITE	9.312E-07	-6.031	-1.582	-0.918
5046000	ARTINITE	4.926E-05	-4.308	-9.600	28.742
5015003	HUNTITE	8.765E-04	-3.057	29.968	25.760
5046001	HYDRMAGNESIT	3.221E-11	-10.492	8.766	52.210
6050000	JAROSITE NA	1.560E-28	-27.807	11.200	36.180
6041002	JAROSITE K	1.877E-26	-25.727	14.800	31.280
6028101	JAROSITE H	4.629E-34	-33.334	12.100	55.150
3028101	MAGHEMITE	4.036E-11	-10.394	-6.386	0.000
5046002	MAGNESITE	7.008E-01	-0.154	8.029	6.169
6015000	ANHYDRITE	1.292E-02	-1.889	4.637	3.769
6028000	MELANTERITE	4.500E-07	-6.347	2.470	-2.860
6050001	MIRABILITE	1.804E-06	-5.744	1.114	-18.987
3050000	NATRON	3.192E-08	-7.496	1.311	-15.745
5046003	NESQUEHONITE	2.736E-03	-2.563	5.621	5.789
5028000	SIDERITE	6.098E-01	-0.215	10.550	5.328
4280000	SRF2	2.044E-11	-10.690	8.540	-1.250
7028100	STRENGITE	4.871E-13	-12.312	26.400	2.030
5080000	STRONTIANITE	3.179E-01	-0.498	9.250	0.690
6050002	THENARDITE	2.103E-07	-6.677	0.179	0.572
5050001	THERMONATR	1.174E-09	-8.930	-0.125	2.802
7028001	VIVIANITE	1.854E-05	-4.732	36.000	0.000
5010000	WITHERITE	4.569E-04	-3.340	8.585	-0.360
2047000	PYROLUSITE	9.253E-17	-16.034	-15.861	29.180
2047001	BIRNESSITE	5.449E-19	-18.264	-18.091	0.000
2047002	NSUTITE	2.105E-18	-17.677	-17.504	0.000
4210000	BAF2	2.254E-16	-15.647	5.760	-1.000
2047100	MANGANITE	8.559E-01	-0.068	0.238	0.000
6047100	MN2(SO4)3	0.000E-01	-54.033	5.711	39.060
2015000	LIME	2.444E-20	-19.612	-32.797	46.265
2015001	PORTLANDITE	3.235E-10	-9.490	-22.675	30.690
2028000	WUSTITE	3.387E-01	-0.470	-11.687	24.846
2046001	PERICLASE	9.259E-09	-8.033	-21.510	36.135
3046001	MAG-FERRITE	5.053E-08	-7.296	-16.765	66.639

Type VI - EXCLUDED SPECIES (not included in mole balance)

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
5015002	DOLOMITE	2.196E+00	0.342	17.000	8.290
3028000	MAGNETITE	1.413E+03	3.150	-3.737	50.460
1	E-1	2.230E+08	8.348	0.000	0.000
3301404	CH4 (g)	2.384E+17	17.377	40.100	-61.000
3300021	O2 (g)	0.000E-01	-82.589	-83.120	133.830

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	1.3	98.7	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401 H2CO3 AQ	
SO4-2	3.2	92.0	PERCENT BOUND IN SPECIES # 732	SO4-2
	1.9		PERCENT BOUND IN SPECIES #4607320 MgSO4 AQ	
	2.8		PERCENT BOUND IN SPECIES #1507320 CaSO4 AQ	
			PERCENT BOUND IN SPECIES #5007320 NaSO4 -	
Sr+2		100.0	PERCENT BOUND IN SPECIES # 800	Sr+2
Be+2		100.0	PERCENT BOUND IN SPECIES # 110	Be+2
H3BO3	16.6	83.4	PERCENT BOUND IN SPECIES # 90	H3BO3
			PERCENT BOUND IN SPECIES #3300900 H2BO3 -1	
E-1				
Cl-1		100.0	PERCENT BOUND IN SPECIES # 180	Cl-1
F-1	2.1	97.6	PERCENT BOUND IN SPECIES # 270	F-1
			PERCENT BOUND IN SPECIES #4602700 MgF +	
Li+1		99.2	PERCENT BOUND IN SPECIES # 440	Li+1
Mg+2	15.6	82.5	PERCENT BOUND IN SPECIES # 460	Mg+2
			PERCENT BOUND IN SPECIES #4607320 MgSO4 AQ	
K+1	1.2	98.8	PERCENT BOUND IN SPECIES # 410	K+1
			PERCENT BOUND IN SPECIES #4107320 KSO4 -	
NO3-1		100.0	PERCENT BOUND IN SPECIES # 492	NO3-1
H2O	4.9	92.2	PERCENT BOUND IN SPECIES #3300020	OH-
	2.5		PERCENT BOUND IN SPECIES #4603300 MgOH +	
			PERCENT BOUND IN SPECIES #2803300 FeOH +	
PO4-3	8.3	2.6	PERCENT BOUND IN SPECIES #3305801	H2PO4 -
	10.3		PERCENT BOUND IN SPECIES #4605800 MgPO4 -	
	3.9		PERCENT BOUND IN SPECIES #4605802 MgHPO4 AQ	
	3.2		PERCENT BOUND IN SPECIES #1505800 CaHPO4 AQ	
	70.7		PERCENT BOUND IN SPECIES #1505801 CaPO4 -	
			PERCENT BOUND IN SPECIES #3305800 HPO4 -2	
Ca+2	1.4	80.4	PERCENT BOUND IN SPECIES # 150	Ca+2
	17.5		PERCENT BOUND IN SPECIES #1501401 CaCO3 AQ	
			PERCENT BOUND IN SPECIES #1507320 CaSO4 AQ	
CO3-2	95.6	2.0	PERCENT BOUND IN SPECIES # 140	CO3-2
			PERCENT BOUND IN SPECIES #3301400 HCO3 -	
Fe+2	5.2	79.7	PERCENT BOUND IN SPECIES # 280	Fe+2
	15.1		PERCENT BOUND IN SPECIES #2803300 FeOH +	
			PERCENT BOUND IN SPECIES #2807320 FeSO4 AQ	
Fe+3	21.0	6.7	PERCENT BOUND IN SPECIES #2813301	FeOH2 +
	72.3		PERCENT BOUND IN SPECIES #2813302 FeOH3 AQ	
			PERCENT BOUND IN SPECIES #2813303 FeOH4 -	
Na+1		99.0	PERCENT BOUND IN SPECIES # 500	Na+1
Mn+3		100.0	PERCENT BOUND IN SPECIES # 471	Mn+3
Ba+2		100.0	PERCENT BOUND IN SPECIES # 100	Ba+2

----- EQUILIBRATED MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.629E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	3.230E-03	100.0	0.000E-01	0.0	1.199E-07	0.0
800	Sr+2	1.485E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
110	Be+2	1.111E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	6.855E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
1	E-1	0.000E-01	0.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	4.574E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	9.464E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
440	Li+1	1.010E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	6.604E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
410	K+1	3.072E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
492	NO3-1	4.289E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	3.748E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	9.388E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	3.463E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.682E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
280	Fe+2	1.792E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
281	Fe+3	1.183E-15	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	1.014E-02	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	5.623E-26	0.0	0.000E-01	0.0	8.563E-06	100.0
100	Ba+2	9.870E-08	45.1	0.000E-01	0.0	1.199E-07	54.9

Charge Balance: SPECIATED

Sum of CATIONS = 1.204E-02 Sum of ANIONS 1.231E-02

PERCENT DIFFERENCE = 1.108E+00 (ANIONS - CATIONS)/(ANIONS + CATIONS)

EQUILIBRIUM IONIC STRENGTH (m) = 1.602E-02

EQUILIBRIUM pH = 8.481

EQUILIBRIUM pe = -8.348 or Eh = -493.85 mv

DATE ID NUMBER: 960925

TIME ID NUMBER: 11195102

Saturation indices and stoichiometry of all minerals

IO #	NAME	Sat. Index	Stoichiometry in [brackets]					
6015000	ANHYDRITE	-1.889	[1.000]	150	[1.000]	732		
5015000	ARAGONITE	-0.139	[1.000]	150	[1.000]	140		
5046000	ARTINITE	-4.308	[-2.000]	330	[2.000]	460	[1.000]	140
			[5.000]	2				
4210000	BAF2	-15.647	[1.000]	100	[2.000]	270		
6010000	BARITE	0.000	[1.000]	100	[1.000]	732		
2046000	BRUCITE	-3.316	[1.000]	460	[2.000]	2	[-2.000]	330
5015001	CALCITE	0.000	[1.000]	150	[1.000]	140		
6080000	CELESTITE	-1.334	[1.000]	800	[1.000]	732		
5015002	OOLOMITE	0.342	[1.000]	150	[1.000]	460	[2.000]	140
6046000	EPSOMITE	-4.095	[1.000]	460	[1.000]	732	[7.000]	2
2028100	FERRIHYDRITE	-6.895	[-3.000]	330	[1.000]	281	[3.000]	2
2028101	FE3(OH)8	-13.335	[-8.000]	330	[2.000]	281	[1.000]	280
			[8.000]	2				
4128100	FE(OH)2.7CL.3	-2.227	[-2.700]	330	[1.000]	281	[2.700]	2
			[0.300]	180				
6028100	FE2(SO4)3	-66.721	[2.000]	281	[3.000]	732		
7015003	HYDRAPATITE	0.000	[5.000]	150	[3.000]	580	[1.000]	2
			[-1.000]	330				
7015002	FCO3APATITE	0.000	[9.496]	150	[0.360]	500	[0.144]	460
			[4.800]	580	[1.200]	140	[2.480]	270
4215000	FLUORITE	-7.008	[1.000]	150	[2.000]	270		
2028102	GOETHITE	-2.504	[-3.000]	330	[1.000]	281	[2.000]	2
6015001	GYPSUM	-1.678	[1.000]	150	[1.000]	732	[2.000]	2
4150000	HALITE	-6.031	[1.000]	500	[1.000]	180		
3028100	HEMATITE	0.000	[-6.000]	330	[2.000]	281	[3.000]	2
5015003	HUNTITE	-3.057	[3.000]	460	[1.000]	150	[4.000]	140
5046001	HYDRMAGNESIT	-10.492	[5.000]	460	[4.000]	140	[-2.000]	330
			[6.000]	2				
6050000	JAROSITE NA	-27.807	[-6.000]	330	[1.000]	500	[3.000]	281
			[2.000]	732	[6.000]	2		
6041002	JAROSITE K	-25.727	[-6.000]	330	[1.000]	410	[3.000]	281
			[2.000]	732	[6.000]	2		
6028101	JAROSITE H	-33.334	[-5.000]	330	[3.000]	281	[2.000]	732
			[7.000]	2				
3028101	MAGHEMITE	-10.394	[-6.000]	330	[2.000]	281	[3.000]	2
5046002	MAGNESITE	-0.154	[1.000]	460	[1.000]	140		
3028000	MAGNETITE	3.150	[-8.000]	330	[2.000]	281	[1.000]	280
			[4.000]	2				
6028000	MELANTERITE	-6.347	[1.000]	280	[1.000]	732	[7.000]	2
6050001	MIRABILITE	-5.744	[2.000]	500	[1.000]	732	[10.000]	2
3050000	NATRON	-7.496	[2.000]	500	[1.000]	140	[10.000]	2
5046003	NESQUEHONITE	-2.563	[1.000]	460	[1.000]	140	[3.000]	2

ID #	NAME	Sat. Index	Stoichiometry in [brackets]					
5028000	SIDERITE	-0.215	[1.000]	280	[1.000]	140		
4280000	SRF2	-10.690	[1.000]	800	[2.000]	270		
7028100	STRENGITE	-12.312	[1.000]	281	[1.000]	580	[2.000]	2
5080000	STRONTIANITE	-0.498	[1.000]	800	[1.000]	140		
6050002	THENARDITE	-6.677	[2.000]	500	[1.000]	732		
5050001	THERMONATR	-8.930	[2.000]	500	[1.000]	140	[1.000]	2
7028001	VIVIANITE	-4.732	[3.000]	280	[2.000]	580	[8.000]	2
5010000	WITHERITE	-3.340	[1.000]	100	[1.000]	140		
2047000	PYROLUSITE	-16.034	[-4.000]	330	[-1.000]	1	[1.000]	471
			[2.000]	2				
2047001	BIRNESSITE	-18.264	[-4.000]	330	[-1.000]	1	[1.000]	471
			[2.000]	2				
2047002	NSUTITE	-17.677	[-4.000]	330	[-1.000]	1	[1.000]	471
			[2.000]	2				
3047100	BIXBYITE	0.000	[-6.000]	330	[2.000]	471	[3.000]	2
2047100	MANGANITE	-0.068	[-3.000]	330	[1.000]	471	[2.000]	2
6047100	MN2(SO4)3	-54.033	[2.000]	471	[3.000]	732		
2015000	LIME	-19.612	[-2.000]	330	[1.000]	150	[1.000]	2
2015001	PORTLANDITE	-9.490	[-2.000]	330	[1.000]	150	[2.000]	2
2028000	WUSTITE	-0.470	[-2.000]	330	[0.947]	280	[1.000]	2
2046001	PERICLASE	-8.033	[-2.000]	330	[1.000]	460	[1.000]	2
3046001	MAG-FERRITE	-7.296	[-8.000]	330	[1.000]	460	[2.000]	281
			[4.000]	2				
3028102	LEPIDOCROCIT	-3.375	[-3.000]	330	[1.000]	281	[2.000]	2

EQUILIBRATION OF GROUNDWATER (WC-5A) WITH WASTE BACKFILL MATERIAL
 pCO2=10E-3.5; INFINITE CALCITE, HEMATITE, APATITE

25.00 MG/L 0.000 0.00000E-01

0 0 1 2 2 0 0 0 1 1 0 0 0

0 0 0

330	2.470E-05	-7.61 y	/H+1
140	1.206E+02	-2.70 y	/CO3-2
100	3.000E-02	-6.66 y	/Ba+2
110	1.000E-03	-6.95 y	/Be+2
90	4.235E+00	-4.16 y	/H3BO3
150	5.940E+01	-2.83 y	/Ca+2
180	1.620E+02	-2.34 y	/Cl-1
270	8.000E-01	-4.38 y	/F-1
440	7.000E-02	-5.00 y	/Li+1
460	1.610E+01	-3.18 y	/Mg+2
471	4.700E-01	-5.07 y	/Mn+3
492	2.657E-01	-5.37 y	/NO3-1
580	3.000E-02	-6.50 y	/PO4-3
410	1.200E+01	-3.51 y	/K+1
500	2.330E+02	-1.99 y	/Na+1
800	1.300E+00	-4.83 y	/Sr+2
732	3.100E+02	-2.49 y	/SO4-2
1	0.000E-01	-0.85 y	/E- (ENTERED AS EH)
281	5.000E-01	-5.27	/Fe+3
280	1.000E-01	-5.27	/Fe+2

3 6

3301403	21.6600	-0.5300	/CO2 (g)
5015001	8.4750	2.5850	/CALCITE
3028100	4.0080	30.8450	/HEMATITE
2802810	13.0320	-10.0000	/Fe+2/Fe+3
7015002	114.4000	-39.3900	/FCO3APATITE
7015003	44.1990	0.0000	/HYDRAPATITE

6 3

1	0.0000	0.0000	/E-1
3028000	-3.7370	50.4600	/MAGNETITE
5015002	17.0000	8.2900	/DOLOMITE

APPENDIX C

MODEL OUTPUT FOR EQUILIBRATION OF 1312 LEACHATE - SAMPLE E-2 SERICITE GNEISS

EQUILIBRATION OF 1312 LEACHATE - SAMPLE E-2 SERICITE GNEISS
 pCO2=10E-3.5; INFINITE CALCITE, HEMATITE, APATITE; CALCULATE Eh

 Temperature (Celsius): 25.00
 Units of concentration: MG/L
 Ionic strength to be computed.
 Carbonate concentration represents carbonate alkalinity.
 Do not automatically terminate if charge imbalance exceeds 30%
 Precipitation is allowed for all solids in the thermodynamic database and
 the print option for solids is set to: 2
 The maximum number of iterations is: 200
 The method used to compute activity coefficients is: Davies equation
 Abbreviated output file

 330 1.561E-05 -7.81 y
 180 1.800E+00 -4.29 y
 270 2.000E-01 -4.98 y
 580 2.000E-02 -6.68 y
 30 3.400E-01 -4.90 y
 100 3.800E-01 -5.56 y
 110 1.000E-03 -6.95 y
 150 1.380E+01 -3.46 y
 460 6.000E-01 -3.00 y
 471 1.300E-01 -5.63
 762 5.000E-02 -6.46 y
 500 8.000E+00 -3.46 y
 800 2.100E-01 -5.62 y
 950 3.500E-01 -5.27 y
 90 1.430E+00 -4.64 y
 140 2.278E+01 -6.84 y
 1 0.000E-01 7.69 y
 280 1.000E-02 -5.75 y
 281 9.000E-02 -5.75

H2O has been inserted as a COMPONENT

3 6
 3301403 21.6600 -0.5300
 5015001 8.4750 2.5850
 3028100 4.0080 30.8450
 7015003 44.1990 0.0000
 7015002 114.4000 -39.3900
 2802810 13.0320 -10.0000
 6 4
 5015000 8.3600 2.6150
 5015002 17.0000 8.2900
 1 0.0000 0.0000
 3028000 -3.7370 50.4600

Charge Balance: UNSPECIATED

Sum of CATIONS= 1.157E-03 Sum of ANIONS = 8.219E-04

PERCENT DIFFERENCE = 1.695E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

 IMPROVED ACTIVITY GUESSES PRIOR TO FIRST ITERATION:

PO4-3	Log activity guess:	-11.31
Al+3	Log activity guess:	-13.20
SeO4-2	Log activity guess:	-6.46
CO3-2	Log activity guess:	-6.04
Fe+2	Log activity guess:	-5.76
Fe+3	Log activity guess:	-18.79

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
0	Sr+2	2.397E-06	2.010E-09	-5.62000	1.770E-09
1	H3BO3	2.313E-05	7.334E-07	-4.66101	7.311E-07
2	Sr+2	2.397E-06	1.210E-06	-5.62037	1.210E-06
3	Sr+2	2.397E-06	-1.481E-06	-5.79786	1.481E-06
4	Sr+2	2.397E-06	1.055E-05	-5.37996	1.055E-05
5	Sr+2	2.397E-06	3.132E-07	-6.11242	3.129E-07
6	Sr+2	2.397E-06	2.996E-07	-6.16575	2.993E-07
7	Sr+2	2.397E-06	-2.298E-07	-6.21689	2.296E-07
8	Sr+2	2.397E-06	-4.129E-07	-6.17312	4.127E-07
9	Sr+2	2.397E-06	-6.029E-07	-6.09101	6.026E-07
10	Sr+2	2.397E-06	-5.285E-07	-5.96518	5.283E-07
11	Sr+2	2.397E-06	-3.735E-07	-5.85700	3.732E-07
12	Sr+2	2.397E-06	-2.278E-07	-5.78344	2.276E-07
13	Sr+2	2.397E-06	-1.209E-07	-5.74006	1.206E-07
14	Mg+2	-1.145E-04	-1.972E-04	-4.72250	1.971E-04
15	Mg+2	-1.145E-04	-5.252E-05	-4.72249	5.250E-05
16	Mg+2	-1.145E-04	-7.376E-06	-4.72249	7.362E-06
17	Mg+2	-1.145E-04	-2.089E-07	-4.72248	1.950E-07
19	Sr+2	2.397E-06	-8.404E-08	-5.71759	8.380E-08
20	Sr+2	2.397E-06	-3.342E-09	-5.70208	3.102E-09
21	Mn+3	2.366E-06	-3.319E-10	-5.80841	9.528E-11

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	1.549E-08	5.351E-09	-8.29187	0.954397	-4.002E-10
180	Cl-1	5.077E-05	5.077E-05	-4.31463	0.954397	-3.104E-11
270	F-1	7.748E-04	1.100E-07	-6.97897	0.954397	1.452E-09
950	Zn+2	5.354E-06	1.589E-06	-5.88009	0.829691	-5.295E-12
30	Al+3	1.260E-05	1.187E-15	-15.10804	0.656995	-7.369E-12
100	Ba+2	2.767E-06	2.767E-06	-5.63908	0.829691	-6.767E-12
110	Be+2	1.110E-07	1.110E-07	-7.03589	0.829691	-2.714E-13
280	Fe+2	1.791E-07	1.699E-07	-6.85089	0.829691	-4.211E-13
460	Mg+2	6.906E-05	2.369E-05	-4.70648	0.829691	2.623E-11
471	Mn+3	2.366E-06	2.366E-06	-5.80835	0.656995	-1.302E-11
762	SeO4-2	3.498E-07	3.497E-07	-6.53738	0.829691	-8.552E-13
90	H3BO3	2.313E-05	2.069E-05	-4.68409	1.000402	-1.261E-12
800	Sr+2	2.397E-06	2.397E-06	-5.70145	0.829691	-5.861E-12
580	PO4-3	1.479E-03	2.238E-12	-11.83251	0.656995	2.711E-20
1	E-1	0.000E-01	9.925E+06	6.99671	0.954397	0.000E-01
150	Ca+2	3.271E-03	4.813E-04	-3.39866	0.829691	0.000E-01
500	Na+1	4.589E-04	3.463E-04	-3.48087	0.954397	-3.047E-21
281	Fe+3	1.612E-06	2.008E-27	-26.87961	0.656995	0.000E-01
2	H2O	0.000E-01	-5.143E-04	-0.00001	1.000000	0.000E-01
140	CO3-2	7.494E-04	1.011E-05	-5.07626	0.829691	1.297E-21

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	2.3	103.3	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		99.5	PERCENT BOUND IN SPECIES #	270 F-1
Zn+2	5.5	29.7	PERCENT BOUND IN SPECIES #	950 Zn+2
	11.9		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	2.8		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
	41.2		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	8.9		PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq
			PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
Al+3	4.6	95.3	PERCENT BOUND IN SPECIES #	303302 Al(OH)4 -
			PERCENT BOUND IN SPECIES #	303303 Al(OH)3 Aq
Ba+2		100.0	PERCENT BOUND IN SPECIES #	100 Ba+2
Be+2		100.0	PERCENT BOUND IN SPECIES #	110 Be+2
Fe+2	5.1	94.9	PERCENT BOUND IN SPECIES #	280 Fe+2
			PERCENT BOUND IN SPECIES #2803300	FeOH +
Mg+2		98.4	PERCENT BOUND IN SPECIES #	460 Mg+2
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
SeO4-2		100.0	PERCENT BOUND IN SPECIES #	762 SeO4-2
H3BO3	10.5	89.5	PERCENT BOUND IN SPECIES #	90 H3BO3
			PERCENT BOUND IN SPECIES #3300900	H2BO3 -1
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
PO4-3	6.5	13.3	PERCENT BOUND IN SPECIES #1505800	CaHPO4 Aq
	73.5		PERCENT BOUND IN SPECIES #1505801	CaPO4 -
	5.3		PERCENT BOUND IN SPECIES #3305800	HPO4 -2
			PERCENT BOUND IN SPECIES #3305801	H2PO4 -
E-1				
Ca+2		98.2	PERCENT BOUND IN SPECIES #	150 Ca+2
Na+1		99.9	PERCENT BOUND IN SPECIES #	500 Na+1
Fe+3	28.5	13.0	PERCENT BOUND IN SPECIES #2813301	FeOH2 +
	58.5		PERCENT BOUND IN SPECIES #2813302	FeOH3 Aq
			PERCENT BOUND IN SPECIES #2813303	FeOH4 -
H2O	89.8	3.9	PERCENT BOUND IN SPECIES #3300020	OH-
	3.3		PERCENT BOUND IN SPECIES #	303302 Al(OH)4 -
	2.4		PERCENT BOUND IN SPECIES #	303303 Al(OH)3 Aq
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
CO3-2	96.6	1.0	PERCENT BOUND IN SPECIES #	140 CO3-2
	1.1		PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq

PART 5 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 9:18: 4

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	9.283E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	5.077E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	1.105E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	5.354E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	1.260E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	2.767E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
110	Be+2	1.110E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
280	Fe+2	1.791E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.408E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	2.366E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
762	SeO4-2	3.498E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	2.313E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	2.397E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	2.733E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
1	E-1	0.000E-01	0.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	4.901E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	3.465E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
281	Fe+3	8.728E-16	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	5.349E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	9.920E-04	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 1.382E-03 Sum of ANIONS 1.048E-03

PERCENT DIFFERENCE = 1.374E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 1.745E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 9:18: 4

ITERATIONS= 22: SOLID BIXBYITE PRECIPITATES

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 9:18: 4

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
22	H3BO3	2.313E-05	-1.029E-07	-4.68409	1.006E-07
23	H3BO3	2.313E-05	9.934E-08	-4.68004	9.702E-08
24	H3BO3	2.313E-05	6.979E-09	-4.68377	4.666E-09
25	Mg+2	-1.145E-04	-6.738E-08	-4.70627	5.352E-08

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	1.549E-08	5.363E-09	-8.29079	0.954488	-6.962E-10
180	Cl-1	5.077E-05	5.077E-05	-4.31459	0.954488	-2.924E-11
270	F-1	7.748E-04	1.097E-07	-6.97995	0.954488	1.020E-09
950	Zn+2	5.354E-06	1.594E-06	-5.87840	0.830009	-4.993E-12
30	Al+3	1.260E-05	1.198E-15	-15.10370	0.657561	-6.982E-12
100	Ba+2	2.767E-06	2.767E-06	-5.63891	0.830009	-6.374E-12
110	Be+2	1.110E-07	1.110E-07	-7.03573	0.830009	-2.556E-13
280	Fe+2	1.791E-07	1.699E-07	-6.85068	0.830009	-3.967E-13
460	Mg+2	6.906E-05	2.369E-05	-4.70630	0.830009	4.518E-12
800	Sr+2	2.397E-06	2.397E-06	-5.70129	0.830009	-5.522E-12
762	SeO4-2	3.498E-07	3.497E-07	-6.53722	0.830009	-8.056E-13
90	H3BO3	2.313E-05	2.069E-05	-4.68397	1.000400	-1.185E-12
471	Mn+3	2.366E-06	1.010E-25	-25.17784	0.657561	-1.898E-20
1	E-1	0.000E-01	9.855E+06	6.99367	0.954488	0.000E-01
580	PO4-3	1.479E-03	2.220E-12	-11.83577	0.657561	-1.146E-20
500	Na+1	4.589E-04	3.463E-04	-3.48083	0.954488	2.349E-21
281	Fe+3	1.612E-06	2.022E-27	-26.87634	0.657561	0.000E-01
150	Ca+2	3.271E-03	4.835E-04	-3.39649	0.830009	8.470E-22
140	CO3-2	7.494E-04	1.006E-05	-5.07844	0.830009	2.975E-20
2	H2O	0.000E-01	-5.131E-04	-0.00001	1.000000	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	2.3	103.3	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		99.5	PERCENT BOUND IN SPECIES #	270 F-1
Zn+2		29.8	PERCENT BOUND IN SPECIES #	950 Zn+2
	5.5		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	11.9		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
	2.8		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	41.1		PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq
	8.8		PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
Al+3	4.7	95.3	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
			PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
Ba+2		100.0	PERCENT BOUND IN SPECIES #	100 Ba+2
Be+2		100.0	PERCENT BOUND IN SPECIES #	110 Be+2
Fe+2	5.1	94.9	PERCENT BOUND IN SPECIES #	280 Fe+2
			PERCENT BOUND IN SPECIES #2803300	FeOH +
Mg+2		98.4	PERCENT BOUND IN SPECIES #	460 Mg+2
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
SeO4-2		100.0	PERCENT BOUND IN SPECIES #	762 SeO4-2
H3BO3	10.5	89.5	PERCENT BOUND IN SPECIES #	90 H3BO3
			PERCENT BOUND IN SPECIES #3300900	H2BO3 -1
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
E-1 PO4-3	6.5	13.4	PERCENT BOUND IN SPECIES #1505800	CaHPO4 Aq
	73.4		PERCENT BOUND IN SPECIES #1505801	CaPO4 -
	5.3		PERCENT BOUND IN SPECIES #3305800	HPO4 -2
			PERCENT BOUND IN SPECIES #3305801	H2PO4 -
Na+1		99.9	PERCENT BOUND IN SPECIES #	500 Na+1
Fe+3	28.5	13.0	PERCENT BOUND IN SPECIES #2813301	FeOH2 +
	58.4		PERCENT BOUND IN SPECIES #2813302	FeOH3 Aq
			PERCENT BOUND IN SPECIES #2813303	FeOH4 -
Ca+2		98.2	PERCENT BOUND IN SPECIES #	150 Ca+2
CO3-2	96.6	1.0	PERCENT BOUND IN SPECIES #	140 CO3-2
	1.1		PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
H2O	89.8	3.8	PERCENT BOUND IN SPECIES #3300020	OH-
	3.3		PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	2.4		PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq

PC MINTEQA2 v3.10 PART 5 of OUTPUT FILE
 DATE OF CALCULATIONS: 24-SEP-96 TIME: 9:18: 5

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	9.259E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	5.077E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	1.103E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	5.354E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	1.260E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	2.767E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
110	Be+2	1.110E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
280	Fe+2	1.791E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.408E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	2.397E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
762	SeO4-2	3.498E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	2.313E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	1.010E-25	0.0	0.000E-01	0.0	2.366E-06	100.0
1	E-1	0.000E-01	0.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	2.721E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	3.465E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
281	Fe+3	8.717E-16	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	4.923E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	9.894E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	5.348E-05	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 1.379E-03 Sum of ANIONS 1.045E-03

PERCENT DIFFERENCE = 1.377E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 1.738E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 9:18: 5

ITERATIONS= 26: SOLID DIASPORE PRECIPITATES

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
26	SeO4-2	3.498E-07	-5.945E-08	-6.53722	5.941E-08
27	SeO4-2	3.498E-07	6.847E-08	-6.45632	6.843E-08
28	SeO4-2	3.498E-07	2.393E-09	-6.53396	2.358E-09
29	Mg+2	-1.145E-04	-6.341E-08	-4.70604	4.955E-08

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	1.549E-08	5.342E-09	-8.29249	0.954637	-5.930E-10
180	Cl-1	5.077E-05	5.077E-05	-4.31453	0.954637	-2.336E-11
270	F-1	7.748E-04	1.101E-07	-6.97846	0.954637	7.789E-10
950	Zn+2	5.354E-06	1.584E-06	-5.88085	0.830526	-3.979E-12
90	H3BO3	2.313E-05	2.069E-05	-4.68415	1.000397	-9.514E-13
100	Ba+2	2.767E-06	2.767E-06	-5.63864	0.830526	-5.092E-12
110	Be+2	1.110E-07	1.110E-07	-7.03546	0.830526	-2.042E-13
280	Fe+2	1.791E-07	1.699E-07	-6.85050	0.830526	-3.168E-13
460	Mg+2	6.906E-05	2.369E-05	-4.70607	0.830526	1.533E-12
800	Sr+2	2.397E-06	2.397E-06	-5.70101	0.830526	-4.410E-12
762	SeO4-2	3.498E-07	3.497E-07	-6.53695	0.830526	-6.435E-13
30	Al+3	1.260E-05	1.503E-18	-18.00446	0.658484	0.000E-01
1	E-1	0.000E-01	9.976E+06	6.99896	0.954637	0.000E-01
140	CO3-2	7.494E-04	1.013E-05	-5.07502	0.830526	0.000E-01
580	PO4-3	1.479E-03	2.243E-12	-11.83066	0.658484	-3.785E-21
281	Fe+3	1.612E-06	1.995E-27	-26.88146	0.658484	0.000E-01
500	Na+1	4.589E-04	3.463E-04	-3.48076	0.954637	-7.548E-24
150	Ca+2	3.271E-03	4.795E-04	-3.39990	0.830526	7.263E-20
471	Mn+3	2.366E-06	9.965E-26	-25.18296	0.658484	0.000E-01
2	H2O	0.000E-01	-4.963E-04	-0.00001	1.000000	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	2.1	98.0	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 AQ
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		99.5	PERCENT BOUND IN SPECIES #	270 F-1
Zn+2	5.5	29.6	PERCENT BOUND IN SPECIES #	950 Zn+2
	11.9		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	2.8		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 AQ
	41.2		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	8.9		PERCENT BOUND IN SPECIES #9501401	ZnCO3 AQ
			PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
H3BO3	10.6	89.4	PERCENT BOUND IN SPECIES #	90 H3BO3
			PERCENT BOUND IN SPECIES #3300900	H2BO3 -1
Ba+2		100.0	PERCENT BOUND IN SPECIES #	100 Ba+2
Be+2		100.0	PERCENT BOUND IN SPECIES #	110 Be+2
Fe+2	5.1	94.9	PERCENT BOUND IN SPECIES #	280 Fe+2
			PERCENT BOUND IN SPECIES #2803300	FeOH +
Mg+2		98.4	PERCENT BOUND IN SPECIES #	460 Mg+2
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
SeO4-2		100.0	PERCENT BOUND IN SPECIES #	762 SeO4-2
Al+3	4.6	95.3	PERCENT BOUND IN SPECIES #	303302 Al(OH)4 -
			PERCENT BOUND IN SPECIES #	303303 Al(OH)3 AQ
E-1				
CO3-2	96.7	1.0	PERCENT BOUND IN SPECIES #	140 CO3-2
	1.1		PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 AQ
PO4-3	6.5	13.3	PERCENT BOUND IN SPECIES #1505800	CaHPO4 AQ
	73.5		PERCENT BOUND IN SPECIES #1505801	CaPO4 -
	5.3		PERCENT BOUND IN SPECIES #3305800	HPO4 -2
			PERCENT BOUND IN SPECIES #3305801	H2PO4 -
Fe+3	28.5	13.0	PERCENT BOUND IN SPECIES #2813301	FeOH2 +
	58.5		PERCENT BOUND IN SPECIES #2813302	FeOH3 AQ
			PERCENT BOUND IN SPECIES #2813303	FeOH4 -
Na+1		99.9	PERCENT BOUND IN SPECIES #	500 Na+1
Ca+2		98.2	PERCENT BOUND IN SPECIES #	150 Ca+2
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
H2O	1.6	55.2	PERCENT BOUND IN SPECIES #3300020	OH-
	7.9		PERCENT BOUND IN SPECIES #	303302 Al(OH)4 -
	34.1		PERCENT BOUND IN SPECIES #9503300	ZnOH +
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 AQ

EQUILIBRATED MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	9.792E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	5.077E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	1.106E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	5.354E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	2.313E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	2.767E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
110	Be+2	1.110E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
280	Fe+2	1.791E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.408E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	2.397E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
762	SeO4-2	3.498E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	1.608E-08	0.1	0.000E-01	0.0	1.259E-05	99.9
1	E-1	0.000E-01	0.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	9.931E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	2.737E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
281	Fe+3	8.732E-16	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	3.465E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	4.882E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	9.965E-26	0.0	0.000E-01	0.0	2.366E-06	100.0
2	H2O	3.738E-06	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 1.371E-03 Sum of ANIONS 1.037E-03

PERCENT DIFFERENCE = 1.387E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

NON-CARBONATE ALKALINITY = 2.077E-06

EQUILIBRIUM IONIC STRENGTH (m) = 1.725E-03

EQUILIBRIUM pH = 8.292

EQUILIBRIUM pe = -6.999 or Eh = -414.03 mv

DATE ID NUMBER: 960924

TIME ID NUMBER: 9180675

EQUILIBRATION OF 1312 LEACHATE - SAMPLE E-2 SERICITE GNEISS
 pCO2=10E-3.5; INFINITE CALCITE, HEMATITE, APATITE; CALCULATE Eh

25.00 MG/L 0.000 0.00000E-01

1 0 1 2 3 0 0 0 1 2 0 0 0

0 0 0

330	1.561E-05	-7.81 y	/H+1
180	1.800E+00	-4.29 y	/Cl-1
270	2.000E-01	-4.98 y	/F-1
580	2.000E-02	-6.68 y	/PO4-3
30	3.400E-01	-4.90 y	/Al+3
100	3.800E-01	-5.56 y	/Ba+2
110	1.000E-03	-6.95 y	/Be+2
150	1.380E+01	-3.46 y	/Ca+2
460	6.000E-01	-3.00 y	/Mg+2
471	1.300E-01	-5.63	/Mn+3
762	5.000E-02	-6.46 y	/SeO4-2
500	8.000E+00	-3.46 y	/Na+1
800	2.100E-01	-5.62 y	/Sr+2
950	3.500E-01	-5.27 y	/Zn+2
90	1.430E+00	-4.64 y	/H3BO3
140	2.278E+01	-6.84 y	/Total CO3-2 alkali
1	0.000E-01	7.69 y	/E- (ENTERED AS EH)
280	1.000E-02	-5.75 y	/Fe+2
281	9.000E-02	-5.75	/Fe+3

3 6

3301403	21.6600	-0.5300	/CO2 (g)
5015001	8.4750	2.5850	/CALCITE
3028100	4.0080	30.8450	/HEMATITE
7015003	44.1990	0.0000	/HYDRAPATITE
7015002	114.4000	-39.3900	/FCO3APATITE
2802810	13.0320	-10.0000	/Fe+2/Fe+3

6 4

5015000	8.3600	2.6150	/ARAGONITE
5015002	17.0000	8.2900	/DOLOMITE
1	0.0000	0.0000	/E-1
3028000	-3.7370	50.4600	/MAGNETITE

APPENDIX D

MODEL OUTPUT FOR EQUILIBRATION OF 1312 LEACHATE - SAMPLE E-4 GRAVEL

EQUILIBRATION OF 1312 LEACHATE - SAMPLE E-4 GRAVEL
pCO2=10E-3.5; INFINITE CALCITE, APATITE

Temperature (Celsius): 25.00
Units of concentration: MG/L
Ionic strength to be computed.
If specified, carbonate concentration represents total inorganic carbon.
Do not automatically terminate if charge imbalance exceeds 30%
Precipitation is allowed for all solids in the thermodynamic database and
the print option for solids is set to: 2
The maximum number of iterations is: 200
The method used to compute activity coefficients is: Davies equation
Abbreviated output file

330 6.215E-06 -8.21 y
180 2.300E+00 -4.29 y
270 2.000E-01 -4.98 y
580 7.000E-02 -6.68 y
30 1.100E-01 -4.90 y
100 2.400E-01 -5.56 y
150 2.700E+01 -3.46 y
460 7.000E-01 -3.00 y
762 7.000E-02 -6.46 y
500 2.100E+01 -3.46
800 9.000E-02 -5.62 y
950 2.100E-01 -5.27 y
90 1.144E+00 -4.64 y
732 2.400E+01 -3.60 y
61 1.895E-02 -6.87 y
600 1.700E-02 -7.09 y
471 9.000E-02 -5.79 y
140 2.400E+01 -6.12 y

H2O has been inserted as a COMPONENT

3 4
3301403 21.6600 -0.5300
5015001 8.4750 2.5850
7015003 44.1990 0.0000
7015002 114.4000 -39.3900
6 2
5015000 8.3600 2.6150
5015002 17.0000 8.2900

Charge Balance: UNSPECIATED

Sum of CATIONS= 2.348E-03 Sum of ANIONS = 1.378E-03

PERCENT DIFFERENCE = 2.602E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

IMPROVED ACTIVITY GUESSES PRIOR TO FIRST ITERATION:

PO4-3	Log activity guess:	-10.31
Al+3	Log activity guess:	-15.26
SeO4-2	Log activity guess:	-6.31
SO4-2	Log activity guess:	-3.60
H3AsO4	Log activity guess:	-14.31
CO3-2	Log activity guess:	-5.24

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:12:15

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
0	SO4-2	2.499E-04	7.439E-05	-3.60229	7.437E-05
1	SO4-2	2.499E-04	5.332E-05	-3.51959	5.329E-05
2	SO4-2	2.499E-04	4.572E-03	-3.60843	4.572E-03
3	SO4-2	2.499E-04	2.357E-03	-3.65143	2.356E-03
4	SO4-2	2.499E-04	1.032E-03	-3.76727	1.032E-03
5	SO4-2	2.499E-04	4.809E-04	-3.93975	4.809E-04
6	SO4-2	2.499E-04	2.232E-04	-4.06156	2.232E-04
7	SO4-2	2.499E-04	2.190E-05	-4.11354	2.188E-05
8	SO4-2	2.499E-04	-4.107E-05	-4.05559	4.104E-05
9	SO4-2	2.499E-04	-3.979E-05	-3.93750	3.976E-05
10	SO4-2	2.499E-04	-2.596E-05	-3.84398	2.593E-05
11	SO4-2	2.499E-04	-1.416E-05	-3.78913	1.414E-05
12	SO4-2	2.499E-04	-6.722E-06	-3.76147	6.697E-06
13	SO4-2	2.499E-04	-2.727E-06	-3.74911	2.702E-06
14	Mg+2	-3.366E-04	-5.189E-06	-4.66936	5.152E-06
15	Mg+2	-3.366E-04	-4.143E-08	-4.66936	4.996E-09
17	SO4-2	2.499E-04	-8.295E-07	-3.74436	8.045E-07
18	SO4-2	2.499E-04	-2.771E-08	-3.74299	2.726E-09

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	6.166E-09	6.299E-09	-8.22613	0.943147	1.021E-09
180	Cl-1	6.488E-05	6.488E-05	-4.21331	0.943147	-7.063E-11
270	F-1	1.053E-05	8.431E-08	-7.09955	0.943147	6.756E-09
61	H3AsO4	1.335E-07	3.629E-15	-14.43987	1.000650	-5.711E-13
30	Al+3	4.077E-06	7.683E-16	-15.34328	0.590491	-4.252E-12
100	Ba+2	1.748E-06	1.748E-06	-5.85923	0.791256	-7.610E-12
600	Pb+2	8.206E-08	8.984E-10	-9.14822	0.791256	-1.179E-14
460	Mg+2	2.880E-05	2.716E-05	-4.66781	0.791256	2.738E-10
762	SeO4-2	4.897E-07	4.896E-07	-6.41181	0.791256	-2.132E-12
471	Mn+3	1.638E-06	1.638E-06	-6.01438	0.590491	-1.605E-11
800	Sr+2	1.027E-06	1.027E-06	-6.09001	0.791256	-4.473E-12
950	Zn+2	3.213E-06	1.194E-06	-6.02471	0.791256	-6.319E-12
90	H3BO3	1.850E-05	1.678E-05	-4.77488	1.000650	-1.438E-12
732	SO4-2	2.499E-04	2.284E-04	-3.74295	0.791256	-9.948E-10
580	PO4-3	7.371E-07	1.581E-12	-12.02975	0.590491	0.000E-01
150	Ca+2	6.737E-04	6.831E-04	-3.26717	0.791256	0.000E-01
500	Na+1	9.135E-04	9.107E-04	-3.06604	0.943147	-8.528E-22
2	H2O	0.000E-01	-4.353E-04	-0.00002	1.000000	0.000E-01
140	CO3-2	4.000E-04	7.833E-06	-5.20776	0.791256	4.388E-22

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	2.5	99.3	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401 H2CO3 AQ	
Cl-1		100.0	PERCENT BOUND IN SPECIES # 180	Cl-1
F-1		99.4	PERCENT BOUND IN SPECIES # 270	F-1
H3AsO4	97.2	2.8	PERCENT BOUND IN SPECIES #3300611	H2AsO4 -
			PERCENT BOUND IN SPECIES #3300612 HAsO4 -2	
Al+3	5.3	94.7	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
			PERCENT BOUND IN SPECIES # 303303 Al(OH)3 AQ	
Ba+2		100.0	PERCENT BOUND IN SPECIES # 100	Ba+2
Pb+2		1.1	PERCENT BOUND IN SPECIES # 600	Pb+2
	1.8		PERCENT BOUND IN SPECIES #6001400 Pb(CO3)2-2	
	3.0		PERCENT BOUND IN SPECIES #6003300 PbOH +	
	93.2		PERCENT BOUND IN SPECIES #6001401 PbCO3 AQ	
Mg+2		96.3	PERCENT BOUND IN SPECIES # 460	Mg+2
	2.4		PERCENT BOUND IN SPECIES #4607320 MgSO4 AQ	
SeO4-2		100.0	PERCENT BOUND IN SPECIES # 762	SeO4-2
Mn+3		100.0	PERCENT BOUND IN SPECIES # 471	Mn+3
Sr+2		100.0	PERCENT BOUND IN SPECIES # 800	Sr+2
Zn+2		37.2	PERCENT BOUND IN SPECIES # 950	Zn+2
	5.8		PERCENT BOUND IN SPECIES #9503300 ZnOH +	
	10.5		PERCENT BOUND IN SPECIES #9503301 Zn(OH)2 AQ	
	1.2		PERCENT BOUND IN SPECIES #9507320 ZnSO4 AQ	
	2.9		PERCENT BOUND IN SPECIES #9501400 ZnHCO3 +	
	36.3		PERCENT BOUND IN SPECIES #9501401 ZnCO3 AQ	
	6.1		PERCENT BOUND IN SPECIES #9501402 Zn(CO3)2-2	
H3BO3		90.7	PERCENT BOUND IN SPECIES # 90	H3BO3
	9.3		PERCENT BOUND IN SPECIES #3300900 H2BO3 -1	
SO4-2		91.4	PERCENT BOUND IN SPECIES # 732	SO4-2
	8.0		PERCENT BOUND IN SPECIES #1507320 CaSO4 AQ	
PO4-3		16.3	PERCENT BOUND IN SPECIES #1505800	CaHPO4 AQ
	6.9		PERCENT BOUND IN SPECIES #1505801 CaPO4 -	
	69.7		PERCENT BOUND IN SPECIES #3305800 HPO4 -2	
	5.6		PERCENT BOUND IN SPECIES #3305801 H2PO4 -	
Ca+2		95.9	PERCENT BOUND IN SPECIES # 150	Ca+2
	2.8		PERCENT BOUND IN SPECIES #1507320 CaSO4 AQ	
Na+1		99.9	PERCENT BOUND IN SPECIES # 500	Na+1
H2O		9.5	PERCENT BOUND IN SPECIES #3300020	OH-
	82.2		PERCENT BOUND IN SPECIES # 303302 Al(OH)4 -	
	3.5		PERCENT BOUND IN SPECIES # 303303 Al(OH)3 AQ	
	3.6		PERCENT BOUND IN SPECIES #9503301 Zn(OH)2 AQ	
CO3-2		96.5	PERCENT BOUND IN SPECIES #3301400	HCO3 -
	1.2		PERCENT BOUND IN SPECIES #3301401 H2CO3 AQ	

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	8.395E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	6.488E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	8.484E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
61	H3AsO4	1.335E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	4.077E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	1.748E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	8.206E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.819E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
762	SeO4-2	4.897E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	1.638E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.027E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	3.213E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	1.850E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	2.499E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	2.231E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	7.125E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	9.120E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	1.878E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	8.642E-04	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 2.349E-03 Sum of ANIONS 1.381E-03

PERCENT DIFFERENCE = 2.595E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 2.822E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:12:17

ITERATIONS= 19: SOLID BIXBYITE PRECIPITATES

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:12:17

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
19	H3BO3	1.850E-05	-8.696E-08	-4.77488	8.511E-08
20	H3BO3	1.850E-05	8.625E-08	-4.76997	8.440E-08
21	H3BO3	1.850E-05	8.765E-09	-4.77449	6.915E-09
22	Zn+2	3.213E-06	-1.149E-09	-6.02422	8.274E-10

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	6.166E-09	6.308E-09	-8.22554	0.943188	5.547E-09
180	Cl-1	6.488E-05	6.488E-05	-4.21329	0.943188	-1.005E-09
270	F-1	1.053E-05	8.420E-08	-7.10008	0.943188	8.617E-08
61	H3AsO4	1.335E-07	3.640E-15	-14.43865	1.000649	-8.150E-12
30	Al+3	4.077E-06	7.721E-16	-15.34092	0.590724	-6.028E-11
100	Ba+2	1.748E-06	1.748E-06	-5.85918	0.791395	-1.082E-10
600	Pb+2	8.206E-08	9.007E-10	-9.14705	0.791395	-1.705E-13
460	Mg+2	2.880E-05	2.716E-05	-4.66775	0.791395	3.319E-09
762	SeO4-2	4.897E-07	4.896E-07	-6.41176	0.791395	-3.032E-11
732	SO4-2	2.499E-04	2.284E-04	-3.74300	0.791395	-1.414E-08
800	Sr+2	1.027E-06	1.027E-06	-6.08995	0.791395	-6.362E-11
950	Zn+2	3.213E-06	1.196E-06	-6.02394	0.791395	-9.011E-11
90	H3BO3	1.850E-05	1.678E-05	-4.77482	1.000649	-2.037E-11
471	Mn+3	1.638E-06	1.764E-25	-24.98208	0.590724	-1.609E-20
580	PO4-3	7.371E-07	1.574E-12	-12.03154	0.590724	-1.236E-20
500	Na+1	9.135E-04	9.107E-04	-3.06603	0.943188	1.431E-22
150	Ca+2	6.737E-04	6.849E-04	-3.26598	0.791395	0.000E-01
140	CO3-2	4.000E-04	7.810E-06	-5.20895	0.791395	3.739E-22
2	H2O	0.000E-01	-4.346E-04	-0.00002	1.000000	-1.059E-22

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	2.5	99.3	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		99.4	PERCENT BOUND IN SPECIES #	270 F-1
H3AsO4	97.2	2.8	PERCENT BOUND IN SPECIES #3300611	H2AsO4 -
			PERCENT BOUND IN SPECIES #3300612	HAso4 -2
Al+3	5.3	94.7	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
			PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
Ba+2		100.0	PERCENT BOUND IN SPECIES #	100 Ba+2
Pb+2	1.8	1.1	PERCENT BOUND IN SPECIES #	600 Pb+2
	3.0		PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	93.2		PERCENT BOUND IN SPECIES #6003300	PbOH +
			PERCENT BOUND IN SPECIES #6001401	PbCO3 Aq
Mg+2	2.4	96.3	PERCENT BOUND IN SPECIES #	460 Mg+2
			PERCENT BOUND IN SPECIES #4607320	MgSO4 Aq
SeO4-2		100.0	PERCENT BOUND IN SPECIES #	762 SeO4-2
SO4-2	8.0	91.4	PERCENT BOUND IN SPECIES #	732 SO4-2
			PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
Zn+2	5.8	37.2	PERCENT BOUND IN SPECIES #	950 Zn+2
	10.5		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	1.2		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
	2.9		PERCENT BOUND IN SPECIES #9507320	ZnSO4 Aq
	36.3		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	6.1		PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq
			PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
H3BO3	9.3	90.7	PERCENT BOUND IN SPECIES #	90 H3BO3
			PERCENT BOUND IN SPECIES #3300900	H2BO3 -1
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
PO4-3	6.9	16.4	PERCENT BOUND IN SPECIES #1505800	CaHPO4 Aq
	69.7		PERCENT BOUND IN SPECIES #1505801	CaPO4 -
	5.6		PERCENT BOUND IN SPECIES #3305800	HPO4 -2
			PERCENT BOUND IN SPECIES #3305801	H2PO4 -
Na+1		99.9	PERCENT BOUND IN SPECIES #	500 Na+1
Ca+2	2.8	95.9	PERCENT BOUND IN SPECIES #	150 Ca+2
			PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq
CO3-2	1.2	96.5	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
H2O	82.2	9.5	PERCENT BOUND IN SPECIES #3300020	OH-
	3.5		PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	3.6		PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq

PC MINTEQA2 v3.10 PART 5 of OUTPUT FILE
 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:12:17

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	8.383E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	6.488E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	8.473E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
61	H3AsO4	1.335E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	4.077E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	1.748E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	8.206E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.819E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
762	SeO4-2	4.897E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	2.499E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.027E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	3.213E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	1.850E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	1.764E-25	0.0	0.000E-01	0.0	1.638E-06	100.0
580	PO4-3	2.226E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	9.120E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	7.143E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	8.630E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	1.877E-05	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 2.348E-03 Sum of ANIONS 1.380E-03

PERCENT DIFFERENCE = 2.597E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 2.817E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:12:17

ITERATIONS= 23: SOLID BA(ASO4)2 PRECIPITATES

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:12:18

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
23	Zn+2	3.213E-06	-3.050E-07	-6.02394	3.047E-07
24	Zn+2	3.213E-06	3.232E-07	-5.94434	3.228E-07
25	Zn+2	3.213E-06	-5.613E-09	-6.02294	5.292E-09
26	Zn+2	3.213E-06	-1.158E-09	-6.02409	8.368E-10
27	H3AsO4	-1.032E-06	9.690E-07	-18.43865	9.689E-07
28	H3AsO4	-1.032E-06	7.408E-07	-19.43865	7.407E-07
29	Sr+2	1.027E-06	1.276E-10	-6.08988	2.487E-11
30	H3AsO4	-1.032E-06	-7.147E-08	-20.30717	7.135E-08
31	H3AsO4	-1.032E-06	-5.321E-09	-20.26688	5.217E-09

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	6.166E-09	6.308E-09	-8.22551	0.943194	3.215E-10
180	Cl-1	6.488E-05	6.488E-05	-4.21328	0.943194	-1.467E-11
270	F-1	1.053E-05	8.420E-08	-7.10011	0.943194	1.420E-09
61	H3AsO4	1.335E-07	5.447E-21	-20.26355	1.000649	-3.301E-11
30	Al+3	4.077E-06	7.723E-16	-15.34080	0.590758	-8.722E-13
90	H3BO3	1.850E-05	1.678E-05	-4.77482	1.000649	-2.987E-13
600	Pb+2	8.206E-08	9.008E-10	-9.14699	0.791415	-2.423E-15
460	Mg+2	2.880E-05	2.716E-05	-4.66771	0.791415	5.783E-11
762	SeO4-2	4.897E-07	4.896E-07	-6.41172	0.791415	-4.429E-13
732	SO4-2	2.499E-04	2.284E-04	-3.74297	0.791415	-2.067E-10
800	Sr+2	1.027E-06	1.027E-06	-6.08992	0.791415	-9.293E-13
950	Zn+2	3.213E-06	1.196E-06	-6.02388	0.791415	-1.313E-12
2	H2O	3.775E-19	-4.346E-04	-0.00002	1.000000	0.000E-01
140	CO3-2	4.000E-04	7.809E-06	-5.20900	0.791415	0.000E-01
580	PO4-3	7.371E-07	1.574E-12	-12.03162	0.590758	-3.160E-22
500	Na+1	9.135E-04	9.107E-04	-3.06602	0.943194	1.758E-24
150	Ca+2	6.737E-04	6.850E-04	-3.26593	0.791415	1.555E-22
471	Mn+3	1.638E-06	1.764E-25	-24.98200	0.590758	0.000E-01
100	Ba+2	1.748E-06	1.547E-06	-5.91199	0.791415	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	2.5	99.3	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401 H2CO3 AQ	
Cl-1		100.0	PERCENT BOUND IN SPECIES # 180	Cl-1
F-1		99.4	PERCENT BOUND IN SPECIES # 270	F-1
H3AsO4	97.2	2.8	PERCENT BOUND IN SPECIES #3300611	H2AsO4 -
			PERCENT BOUND IN SPECIES #3300612 HAsO4 -2	
Al+3	5.3	94.7	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
			PERCENT BOUND IN SPECIES # 303303 Al(OH)3 AQ	
H3BO3	9.3	90.7	PERCENT BOUND IN SPECIES # 90	H3BO3
			PERCENT BOUND IN SPECIES #3300900 H2BO3 -1	
Pb+2	1.8	1.1	PERCENT BOUND IN SPECIES # 600	Pb+2
	3.0		PERCENT BOUND IN SPECIES #6001400 Pb(CO3)2-2	
	93.2		PERCENT BOUND IN SPECIES #6003300 PbOH +	
			PERCENT BOUND IN SPECIES #6001401 PbCO3 AQ	
Mg+2	2.4	96.3	PERCENT BOUND IN SPECIES # 460	Mg+2
			PERCENT BOUND IN SPECIES #4607320 MgSO4 AQ	
SeO4-2		100.0	PERCENT BOUND IN SPECIES # 762	SeO4-2
SO4-2	8.0	91.4	PERCENT BOUND IN SPECIES # 732	SO4-2
			PERCENT BOUND IN SPECIES #1507320 CaSO4 AQ	
Sr+2		100.0	PERCENT BOUND IN SPECIES # 800	Sr+2
Zn+2	5.8	37.2	PERCENT BOUND IN SPECIES # 950	Zn+2
	10.5		PERCENT BOUND IN SPECIES #9503300 ZnOH +	
	1.2		PERCENT BOUND IN SPECIES #9503301 Zn(OH)2 AQ	
	2.9		PERCENT BOUND IN SPECIES #9507320 ZnSO4 AQ	
	36.3		PERCENT BOUND IN SPECIES #9501400 ZnHCO3 +	
	6.1		PERCENT BOUND IN SPECIES #9501401 ZnCO3 AQ	
			PERCENT BOUND IN SPECIES #9501402 Zn(CO3)2-2	
H2O	82.2	9.5	PERCENT BOUND IN SPECIES #3300020	OH-
	3.5		PERCENT BOUND IN SPECIES # 303302 Al(OH)4 -	
	3.6		PERCENT BOUND IN SPECIES # 303303 Al(OH)3 AQ	
			PERCENT BOUND IN SPECIES #9503301 Zn(OH)2 AQ	
CO3-2	1.2	96.5	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401 H2CO3 AQ	
PO4-3	6.9	16.4	PERCENT BOUND IN SPECIES #1505800	CaHPO4 AQ
	69.7		PERCENT BOUND IN SPECIES #1505801 CaPO4 -	
	5.6		PERCENT BOUND IN SPECIES #3305800 HPO4 -2	
			PERCENT BOUND IN SPECIES #3305801 H2PO4 -	
Na+1		99.9	PERCENT BOUND IN SPECIES # 500	Na+1
Ca+2	2.8	95.9	PERCENT BOUND IN SPECIES # 150	Ca+2
			PERCENT BOUND IN SPECIES #1507320 CaSO4 AQ	
Mn+3		100.0	PERCENT BOUND IN SPECIES # 471	Mn+3
Ba+2		100.0	PERCENT BOUND IN SPECIES # 100	Ba+2

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	8.385E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	6.488E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	8.473E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
61	H3AsO4	1.998E-13	0.0	0.000E-01	0.0	1.335E-07	100.0
30	Al+3	4.077E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	1.850E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	8.206E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.819E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
762	SeO4-2	4.897E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	2.499E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.027E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	3.213E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	1.877E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	8.629E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	2.225E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	9.120E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	7.144E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	1.764E-25	0.0	0.000E-01	0.0	1.638E-06	100.0
100	Ba+2	1.547E-06	88.5	0.000E-01	0.0	2.002E-07	11.5

Charge Balance: SPECIATED

Sum of CATIONS = 2.348E-03 Sum of ANIONS 1.380E-03

PERCENT DIFFERENCE = 2.597E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 2.816E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:12:18

ITERATIONS= 32: SOLID DIASPORE PRECIPITATES

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:12:19

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
32	Sr+2	1.027E-06	-2.143E-07	-6.08992	2.142E-07
33	Sr+2	1.027E-06	2.620E-07	-5.98832	2.619E-07
34	Sr+2	1.027E-06	7.674E-09	-6.08699	7.570E-09
35	Sr+2	1.027E-06	-8.376E-10	-6.09022	7.348E-10

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	6.166E-09	6.301E-09	-8.22595	0.943234	5.521E-09
180	Cl-1	6.488E-05	6.488E-05	-4.21327	0.943234	-9.917E-10
270	F-1	1.053E-05	8.427E-08	-7.09973	0.943234	8.540E-08
61	H3AsO4	1.335E-07	5.430E-21	-20.26491	1.000648	6.131E-11
950	Zn+2	3.213E-06	1.194E-06	-6.02442	0.791548	-8.889E-11
90	H3BO3	1.850E-05	1.678E-05	-4.77486	1.000648	-2.013E-11
600	Pb+2	8.206E-08	8.988E-10	-9.14785	0.791548	-1.683E-13
460	Mg+2	2.880E-05	2.715E-05	-4.66768	0.791548	3.296E-09
762	SeO4-2	4.897E-07	4.896E-07	-6.41167	0.791548	-2.994E-11
732	SO4-2	2.499E-04	2.284E-04	-3.74285	0.791548	-1.396E-08
800	Sr+2	1.027E-06	1.027E-06	-6.08987	0.791548	-6.280E-11
30	Al+3	4.077E-06	2.652E-18	-17.80480	0.590982	0.000E-01
150	Ca+2	6.737E-04	6.835E-04	-3.26680	0.791548	2.202E-20
140	CO3-2	4.000E-04	7.823E-06	-5.20813	0.791548	0.000E-01
580	PO4-3	7.371E-07	1.578E-12	-12.03030	0.590982	8.470E-22
500	Na+1	9.135E-04	9.107E-04	-3.06600	0.943234	-1.008E-22
471	Mn+3	1.638E-06	1.758E-25	-24.98331	0.590982	0.000E-01
100	Ba+2	1.748E-06	1.547E-06	-5.91195	0.791548	0.000E-01
2	H2O	3.775E-19	-4.290E-04	-0.00002	1.000000	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	2.5	97.4	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
Cl-1		100.0	PERCENT BOUND IN SPECIES # 180	Cl-1
F-1		99.4	PERCENT BOUND IN SPECIES # 270	F-1
H3AsO4	97.2	2.8	PERCENT BOUND IN SPECIES #3300611	H2AsO4 -
			PERCENT BOUND IN SPECIES #3300612	HASO4 -2
Zn+2		37.2	PERCENT BOUND IN SPECIES # 950	Zn+2
	5.8		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	10.5		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
	1.2		PERCENT BOUND IN SPECIES #9507320	ZnSO4 Aq
	2.9		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	36.3		PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq
	6.1		PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
H3BO3		90.7	PERCENT BOUND IN SPECIES # 90	H3BO3
	9.3		PERCENT BOUND IN SPECIES #3300900	H2BO3 -1
Pb+2		1.1	PERCENT BOUND IN SPECIES # 600	Pb+2
	1.8		PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	3.0		PERCENT BOUND IN SPECIES #6003300	PbOH +
	93.2		PERCENT BOUND IN SPECIES #6001401	PbCO3 Aq
Mg+2		96.3	PERCENT BOUND IN SPECIES # 460	Mg+2
	2.4		PERCENT BOUND IN SPECIES #4607320	MgSO4 Aq
SeO4-2		100.0	PERCENT BOUND IN SPECIES # 762	SeO4-2
SO4-2		91.4	PERCENT BOUND IN SPECIES # 732	SO4-2
	8.0		PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq
Sr+2		100.0	PERCENT BOUND IN SPECIES # 800	Sr+2
Al+3		94.7	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	5.3		PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
Ca+2		95.9	PERCENT BOUND IN SPECIES # 150	Ca+2
	2.8		PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq
CO3-2		96.5	PERCENT BOUND IN SPECIES #3301400	HCO3 -
	1.2		PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
PO4-3		16.4	PERCENT BOUND IN SPECIES #1505800	CaHPO4 Aq
	6.9		PERCENT BOUND IN SPECIES #1505801	CaPO4 -
	69.7		PERCENT BOUND IN SPECIES #3305800	HPO4 -2
	5.6		PERCENT BOUND IN SPECIES #3305801	H2PO4 -
Na+1		99.9	PERCENT BOUND IN SPECIES # 500	Na+1
Mn+3		100.0	PERCENT BOUND IN SPECIES # 471	Mn+3
Ba+2		100.0	PERCENT BOUND IN SPECIES # 100	Ba+2
H2O		65.4	PERCENT BOUND IN SPECIES #3300020	OH-
	1.9		PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	6.7		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	24.6		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq

 PART 5 of OUTPUT FILE

 PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:12:19

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	8.553E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	6.488E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	8.480E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
61	H3AsO4	1.995E-13	0.0	0.000E-01	0.0	1.336E-07	100.0
950	Zn+2	3.213E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	1.850E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	8.206E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.819E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
762	SeO4-2	4.897E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	2.499E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.027E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	1.406E-08	0.3	0.000E-01	0.0	4.063E-06	99.7
150	Ca+2	7.128E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	8.637E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	2.229E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	9.120E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	1.758E-25	0.0	0.000E-01	0.0	1.638E-06	100.0
100	Ba+2	1.547E-06	88.5	0.000E-01	0.0	2.004E-07	11.5
2	H2O	2.741E-06	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 2.345E-03 Sum of ANIONS 1.377E-03

PERCENT DIFFERENCE = 2.601E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 2.812E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:12:20

ITERATIONS= 36: SOLID BARITE PRECIPITATES

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 25-SEP-96 TIME: 11:12:20

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVY	RESIDUAL
36	Sr+2	1.027E-06	-2.142E-07	-6.08987	2.141E-07
37	Sr+2	1.027E-06	2.572E-07	-5.98832	2.571E-07
38	Sr+2	1.027E-06	1.120E-08	-6.08537	1.109E-08
39	Sr+2	1.027E-06	-6.189E-10	-6.09008	5.162E-10

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVY	GAMMA	DIFF FXN
330	H+1	6.166E-09	6.302E-09	-8.22592	0.943262	2.729E-08
180	Cl-1	6.488E-05	6.488E-05	-4.21326	0.943262	-8.783E-10
270	F-1	1.053E-05	8.426E-08	-7.09976	0.943262	7.274E-08
61	H3AsO4	1.335E-07	1.639E-20	-19.78506	1.000647	-8.279E-09
950	Zn+2	3.213E-06	1.194E-06	-6.02434	0.791644	-7.867E-11
90	H3BO3	1.850E-05	1.678E-05	-4.77485	1.000647	-1.786E-11
600	Pb+2	8.206E-08	8.988E-10	-9.14779	0.791644	-1.473E-13
460	Mg+2	2.880E-05	2.716E-05	-4.66759	0.791644	2.750E-09
762	SeO4-2	4.897E-07	4.896E-07	-6.41162	0.791644	-2.651E-11
800	Sr+2	1.027E-06	1.027E-06	-6.08981	0.791644	-5.563E-11
471	Mn+3	1.638E-06	1.758E-25	-24.98322	0.591143	-1.588E-20
500	Na+1	9.135E-04	9.107E-04	-3.06599	0.943262	1.022E-20
150	Ca+2	6.737E-04	6.835E-04	-3.26674	0.791644	8.230E-22
140	CO3-2	4.000E-04	7.821E-06	-5.20819	0.791644	-2.118E-22
580	PO4-3	7.371E-07	1.577E-12	-12.03040	0.591143	8.867E-22
30	Al+3	4.077E-06	2.652E-18	-17.80471	0.591143	0.000E-01
732	SO4-2	2.499E-04	2.276E-04	-3.74421	0.791644	0.000E-01
2	H2O	3.775E-19	-4.289E-04	-0.00002	1.000000	0.000E-01
100	Ba+2	1.748E-06	7.408E-07	-6.23179	0.791644	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
 TYPE I and TYPE II (dissolved and adsorbed) species

H+1	2.5	97.4	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		99.4	PERCENT BOUND IN SPECIES #	270 F-1
H3AsO4	97.2	2.8	PERCENT BOUND IN SPECIES #3300611	H2AsO4 -
			PERCENT BOUND IN SPECIES #3300612	HAsO4 -2
Zn+2	5.8	37.2	PERCENT BOUND IN SPECIES #	950 Zn+2
	10.5		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	1.2		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
	2.9		PERCENT BOUND IN SPECIES #9507320	ZnSO4 Aq
	36.3		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	6.1		PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq
			PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
H3BO3	9.3	90.7	PERCENT BOUND IN SPECIES #	90 H3BO3
			PERCENT BOUND IN SPECIES #3300900	H2BO3 -1
Pb+2	1.8	1.1	PERCENT BOUND IN SPECIES #	600 Pb+2
	3.0		PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	93.2		PERCENT BOUND IN SPECIES #6003300	PbOH +
			PERCENT BOUND IN SPECIES #6001401	PbCO3 Aq
Mg+2	2.4	96.3	PERCENT BOUND IN SPECIES #	460 Mg+2
			PERCENT BOUND IN SPECIES #4607320	MgSO4 Aq
SeO4-2		100.0	PERCENT BOUND IN SPECIES #	762 SeO4-2
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
Na+1		99.9	PERCENT BOUND IN SPECIES #	500 Na+1
Ca+2	2.8	95.9	PERCENT BOUND IN SPECIES #	150 Ca+2
			PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq
CO3-2	1.2	96.5	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
PO4-3	6.9	16.4	PERCENT BOUND IN SPECIES #1505800	CaHPO4 Aq
	69.7		PERCENT BOUND IN SPECIES #1505801	CaPO4 -
	5.6		PERCENT BOUND IN SPECIES #3305800	HPO4 -2
			PERCENT BOUND IN SPECIES #3305801	H2PO4 -
Al+3	5.3	94.7	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
			PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
SO4-2	8.0	91.4	PERCENT BOUND IN SPECIES #	732 SO4-2
			PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq
H2O	1.9	65.4	PERCENT BOUND IN SPECIES #3300020	OH-
	6.7		PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	24.6		PERCENT BOUND IN SPECIES #9503300	ZnOH +
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
Ba+2		100.0	PERCENT BOUND IN SPECIES #	100 Ba+2

----- EQUILIBRATED MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	8.553E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	6.488E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	8.479E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
61	H3AsO4	6.022E-13	0.0	0.000E-01	0.0	1.252E-07	100.0
950	Zn+2	3.213E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	1.850E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	8.206E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.819E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
762	SeO4-2	4.897E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.027E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	1.758E-25	0.0	0.000E-01	0.0	1.638E-06	100.0
500	Na+1	9.120E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	7.128E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	8.636E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	2.228E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	1.406E-08	0.3	0.000E-01	0.0	4.063E-06	99.7
732	SO4-2	2.490E-04	99.7	0.000E-01	0.0	8.190E-07	0.3
2	H2O	2.741E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	7.408E-07	42.4	0.000E-01	0.0	1.007E-06	57.6

Charge Balance: SPECIATED

Sum of CATIONS = 2.343E-03 Sum of ANIONS 1.375E-03

PERCENT DIFFERENCE = 2.603E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

EQUILIBRIUM IONIC STRENGTH (m) = 2.809E-03

EQUILIBRIUM pH = 8.226

DATE ID NUMBER: 960925

TIME ID NUMBER: 11122123

EQUILIBRATION OF 1312 LEACHATE - SAMPLE E-4 GRAVEL
 pCO2=10E-3.5; INFINITE CALCITE, APATITE

25.00 MG/L 0.000 0.00000E-01

0 0 1 2 3 0 0 0 1 2 0 0 0

0 0 0

330	6.215E-06	-8.21 y	/H+1
180	2.300E+00	-4.29 y	/Cl-1
270	2.000E-01	-4.98 y	/F-1
580	7.000E-02	-6.68 y	/PO4-3
30	1.100E-01	-4.90 y	/Al+3
100	2.400E-01	-5.56 y	/Ba+2
150	2.700E+01	-3.46 y	/Ca+2
460	7.000E-01	-3.00 y	/Mg+2
762	7.000E-02	-6.46 y	/SeO4-2
500	2.100E+01	-3.46	/Na+1
800	9.000E-02	-5.62 y	/Sr+2
950	2.100E-01	-5.27 y	/Zn+2
90	1.144E+00	-4.64 y	/H3BO3
732	2.400E+01	-3.60 y	/SO4-2
61	1.895E-02	-6.87 y	/H3AsO4
600	1.700E-02	-7.09 y	/Pb+2
471	9.000E-02	-5.79 y	/Mn+3
140	2.400E+01	-6.12 y	/TOTAL CARBON, CO3

3 4

3301403	21.6600	-0.5300	/CO2 (g)
5015001	8.4750	2.5850	/CALCITE
7015003	44.1990	0.0000	/HYDRAPATITE
7015002	114.4000	-39.3900	/FCO3APATITE
6 2			
5015000	8.3600	2.6150	/ARAGONITE
5015002	17.0000	8.2900	/DOLOMITE

APPENDIX E

MODEL OUTPUT FOR EQUILIBRATION OF 1312 LEACHATE - SAMPLE W-2 BIOTITE GNEISS

EQUILIBRATION OF 1312 LEACHATE - SAMPLE W-2 BIOTITE GNEISS
 pCO2=10E-3.5; INFINITE CALCITE, HEMATITE, APATITE

 Temperature (Celsius): 25.00
 Units of concentration: MG/L
 Ionic strength to be computed.
 If specified, carbonate concentration represents total inorganic carbon.
 Do not automatically terminate if charge imbalance exceeds 30%
 Precipitation is allowed for all solids in the thermodynamic database and
 the print option for solids is set to: 2
 The maximum number of iterations is: 200
 The method used to compute activity coefficients is: Davies equation
 Abbreviated output file

 330 6.215E-06 -8.21 y
 180 8.000E-01 -4.29 y
 270 1.000E-01 -4.98 y
 580 5.000E-02 -6.68 y
 30 3.200E-01 -4.90 y
 100 2.100E-01 -5.56 y
 150 1.180E+01 -3.46 y
 460 8.000E-01 -3.00 y
 500 6.000E+00 -3.46 y
 800 3.500E-01 -5.62
 950 1.900E-01 -5.27 y
 90 7.436E-01 -4.64 y
 61 3.790E-02 -6.87 y
 600 5.000E-03 -7.09 y
 281 1.500E-01 -5.57 y
 471 4.000E-02 -6.14
 140 4.080E+01 -5.89 y
 360 4.000E-04 -9.00

H2O has been inserted as a COMPONENT

3	5	
3301403	21.6600	-0.5300
5015001	8.4750	2.5850
7015003	44.1990	0.0000
7015002	114.4000	-39.3900
3028100	4.0080	30.8450
6	2	
5015000	8.3600	2.6150
5015002	17.0000	8.2900

Charge Balance: UNSPECIATED

Sum of CATIONS= 9.784E-04 Sum of ANIONS = 1.389E-03

PERCENT DIFFERENCE = 1.735E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

 IMPROVED ACTIVITY GUESSES PRIOR TO FIRST ITERATION:

PO4-3	Log activity guess:	-10.46
Al+3	Log activity guess:	-14.79
H3AsO4	Log activity guess:	-14.01
Fe+3	Log activity guess:	-17.10
CO3-2	Log activity guess:	-5.24

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:25

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVY	RESIDUAL
0	H3BO3	1.203E-05	1.302E-05	-4.64000	1.301E-05
1	H3AsO4	2.670E-07	8.313E-07	-15.00769	8.312E-07
2	H3AsO4	2.670E-07	1.617E-06	-14.76362	1.617E-06
3	H3AsO4	2.670E-07	6.413E-07	-14.77605	6.412E-07
4	H3AsO4	2.670E-07	1.261E-07	-14.81173	1.260E-07
5	H3AsO4	2.670E-07	-4.323E-08	-14.82379	4.320E-08
6	H3AsO4	2.670E-07	-5.175E-08	-14.71047	5.173E-08
7	H3AsO4	2.670E-07	-3.320E-08	-14.59999	3.317E-08
8	H3AsO4	2.670E-07	-1.844E-08	-14.53249	1.841E-08
9	H3AsO4	2.670E-07	-9.093E-09	-14.49605	9.066E-09
10	H3AsO4	2.670E-07	-4.006E-09	-14.47837	3.979E-09
11	H3AsO4	2.670E-07	-1.552E-09	-14.47064	1.525E-09
12	H3AsO4	2.670E-07	-4.422E-10	-14.46766	4.154E-10
13	H3AsO4	2.670E-07	-5.665E-11	-14.46681	2.994E-11

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVY	GAMMA	DIFF FXN
330	H+1	6.166E-09	4.101E-09	-8.40561	0.958204	1.972E-09
180	Cl-1	2.257E-05	2.257E-05	-4.66508	0.958204	-5.764E-11
270	F-1	5.264E-06	1.413E-07	-6.86849	0.958204	4.577E-09
600	Pb+2	2.413E-08	1.083E-10	-10.03938	0.843010	-1.128E-14
30	Al+3	1.186E-05	3.836E-16	-15.58295	0.680963	-2.918E-11
100	Ba+2	1.529E-06	1.529E-06	-5.88973	0.843010	-1.562E-11
360	Hg2+2	9.971E-10	9.971E-10	-9.07542	0.843010	-1.019E-14
460	Mg+2	3.291E-05	3.185E-05	-4.57110	0.843010	-6.066E-11
471	Mn+3	7.281E-07	7.281E-07	-6.30467	0.680963	-1.674E-11
800	Sr+2	3.995E-06	3.995E-06	-5.47269	0.843010	-4.082E-11
950	Zn+2	2.907E-06	5.489E-07	-6.33467	0.843010	-1.086E-11
90	H3BO3	1.203E-05	1.043E-05	-4.98138	1.000333	-3.631E-12
61	H3AsO4	2.670E-07	3.413E-15	-14.46671	1.000333	-2.691E-12
580	PO4-3	5.265E-07	4.738E-12	-11.49129	0.680963	-2.711E-20
150	Ca+2	2.944E-04	2.806E-04	-3.62615	0.843010	0.000E-01
500	Na+1	2.610E-04	2.600E-04	-3.60353	0.958204	4.503E-23
281	Fe+3	2.686E-06	8.832E-28	-27.22083	0.680963	2.482E-23
140	CO3-2	6.799E-04	1.680E-05	-4.84878	0.843010	1.317E-22
2	H2O	0.000E-01	-6.554E-04	-0.00001	1.000000	-2.118E-22

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	1.7	102.3	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		99.6	PERCENT BOUND IN SPECIES #	270 F-1
Pb+2	2.0	3.9	PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	93.1		PERCENT BOUND IN SPECIES #6003300	PbOH +
			PERCENT BOUND IN SPECIES #6001401	PbCO3 Aq
Al+3	3.6	96.4	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
			PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
Ba+2		100.0	PERCENT BOUND IN SPECIES #	100 Ba+2
Hg2+2		100.0	PERCENT BOUND IN SPECIES #	360 Hg2+2
Mg+2	1.1	97.7	PERCENT BOUND IN SPECIES #	460 Mg+2
	1.2		PERCENT BOUND IN SPECIES #4601400	MgCO3 Aq
			PERCENT BOUND IN SPECIES #4601401	MgHCO3 +
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
Zn+2		18.9	PERCENT BOUND IN SPECIES #	950 Zn+2
	4.6		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	13.0		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
	2.3		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	45.0		PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq
	16.2		PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
H3BO3	13.2	86.8	PERCENT BOUND IN SPECIES #	90 H3BO3
			PERCENT BOUND IN SPECIES #3300900	H2BO3 -1
H3AsO4	98.0	1.9	PERCENT BOUND IN SPECIES #3300611	H2AsO4 -
			PERCENT BOUND IN SPECIES #3300612	HAsO4 -2
PO4-3		1.3	PERCENT BOUND IN SPECIES #4605802	MgHPO4 Aq
	8.7		PERCENT BOUND IN SPECIES #1505800	CaHPO4 Aq
	5.4		PERCENT BOUND IN SPECIES #1505801	CaPO4 -
	79.2		PERCENT BOUND IN SPECIES #3305800	HPO4 -2
	4.4		PERCENT BOUND IN SPECIES #3305801	H2PO4 -
Ca+2	1.1	97.3	PERCENT BOUND IN SPECIES #	150 Ca+2
	1.7		PERCENT BOUND IN SPECIES #1501400	CaHCO3 +
			PERCENT BOUND IN SPECIES #1501401	CaCO3 Aq
Na+1		99.9	PERCENT BOUND IN SPECIES #	500 Na+1
Fe+3	25.0	8.7	PERCENT BOUND IN SPECIES #2813301	FeOH2 +
	66.3		PERCENT BOUND IN SPECIES #2813302	FeOH3 Aq
			PERCENT BOUND IN SPECIES #2813303	FeOH4 -
CO3-2	97.0	1.3	PERCENT BOUND IN SPECIES #	140 CO3-2
			PERCENT BOUND IN SPECIES #3301400	HCO3 -
H2O	90.4	5.3	PERCENT BOUND IN SPECIES #3300020	OH-
	2.6		PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	1.5		PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.213E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	2.257E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	1.418E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	2.413E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	1.186E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	1.529E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
360	Hg2+2	9.971E-10	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	3.261E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	7.281E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	3.995E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	2.907E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	1.203E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
61	H3AsO4	2.670E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	4.211E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	2.884E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	2.603E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
281	Fe+3	9.966E-16	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.279E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	5.060E-05	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 9.028E-04 Sum of ANIONS 1.314E-03

PERCENT DIFFERENCE = 1.856E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 1.447E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:26

ITERATIONS= 15: SOLID BIXBYITE PRECIPITATES

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:27

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
15	H3BO3	1.203E-05	-6.307E-08	-4.98138	6.187E-08
16	H3BO3	1.203E-05	6.033E-08	-4.97827	5.912E-08
17	H3BO3	1.203E-05	2.409E-09	-4.98121	1.207E-09
18	Sr+2	3.995E-06	7.609E-10	-5.47252	3.614E-10

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	6.166E-09	4.105E-09	-8.40522	0.958245	-1.385E-09
180	Cl-1	2.257E-05	2.257E-05	-4.66506	0.958245	3.961E-11
270	F-1	5.264E-06	1.411E-07	-6.86885	0.958245	-3.189E-09
600	Pb+2	2.413E-08	1.085E-10	-10.03857	0.843153	7.731E-15
30	Al+3	1.186E-05	3.849E-16	-15.58136	0.681223	1.999E-11
100	Ba+2	1.529E-06	1.529E-06	-5.88965	0.843153	1.074E-11
360	Hg2+2	9.971E-10	9.971E-10	-9.07534	0.843153	7.002E-15
460	Mg+2	3.291E-05	3.185E-05	-4.57101	0.843153	3.916E-11
61	H3AsO4	2.670E-07	3.420E-15	-14.46584	1.000333	1.848E-12
800	Sr+2	3.995E-06	3.995E-06	-5.47261	0.843153	2.805E-11
950	Zn+2	2.907E-06	5.498E-07	-6.33390	0.843153	7.454E-12
90	H3BO3	1.203E-05	1.044E-05	-4.98133	1.000333	2.493E-12
471	Mn+3	7.281E-07	4.421E-26	-25.52114	0.681223	-2.425E-20
580	PO4-3	5.265E-07	4.723E-12	-11.49248	0.681223	1.337E-20
500	Na+1	2.610E-04	2.600E-04	-3.60351	0.958245	-2.363E-23
150	Ca+2	2.944E-04	2.810E-04	-3.62536	0.843153	-8.470E-22
140	CO3-2	6.799E-04	1.677E-05	-4.84957	0.843153	1.079E-22
281	Fe+3	2.686E-06	8.853E-28	-27.21964	0.681223	0.000E-01
2	H2O	0.000E-01	-6.548E-04	-0.00001	1.000000	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	1.7	102.3	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		99.6	PERCENT BOUND IN SPECIES #	270 F-1
Pb+2	2.0	3.9	PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	93.1		PERCENT BOUND IN SPECIES #6003300	PbOH +
			PERCENT BOUND IN SPECIES #6001401	PbCO3 Aq
Al+3	3.6	96.4	PERCENT BOUND IN SPECIES # 3D3302	Al(OH)4 -
			PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
Ba+2		100.0	PERCENT BOUND IN SPECIES #	100 Ba+2
Hg2+2		100.0	PERCENT BOUND IN SPECIES #	360 Hg2+2
Mg+2	1.1	97.7	PERCENT BOUND IN SPECIES #	460 Mg+2
	1.2		PERCENT BOUND IN SPECIES #4601400	MgCO3 Aq
			PERCENT BOUND IN SPECIES #4601401	MgHCO3 +
H3AsO4	98.0	1.9	PERCENT BOUND IN SPECIES #3300611	H2AsO4 -
			PERCENT BOUND IN SPECIES #3300612	HAsO4 -2
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
Zn+2	4.6	18.9	PERCENT BOUND IN SPECIES #	950 Zn+2
	13.0		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	2.3		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
	45.0		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	16.1		PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq
			PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
H3BO3	13.2	86.8	PERCENT BOUND IN SPECIES #	90 H3BO3
			PERCENT BOUND IN SPECIES #33D0900	H2BO3 -1
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
PO4-3	8.7	1.3	PERCENT BOUND IN SPECIES #4605802	MgHPO4 Aq
	5.4		PERCENT BOUND IN SPECIES #1505800	CaHPO4 Aq
	79.2		PERCENT BOUND IN SPECIES #1505801	CaPO4 -
	4.4		PERCENT BOUND IN SPECIES #3305800	HPO4 -2
			PERCENT BOUND IN SPECIES #3305801	H2PO4 -
Na+1		99.9	PERCENT BOUND IN SPECIES #	500 Na+1
Ca+2	1.1	97.3	PERCENT BOUND IN SPECIES #	150 Ca+2
	1.6		PERCENT BOUND IN SPECIES #1501400	CaHCO3 +
			PERCENT BOUND IN SPECIES #1501401	CaCO3 Aq
CO3-2	97.0	1.3	PERCENT BOUND IN SPECIES #	140 CO3-2
			PERCENT BOUND IN SPECIES #3301400	HCO3 -
Fe+3	25.0	8.7	PERCENT BOUND IN SPECIES #2813301	FeOH2 +
	66.3		PERCENT BOUND IN SPECIES #2813302	FeOH3 Aq
			PERCENT BOUND IN SPECIES #2813303	FeOH4 -
H2O	90.4	5.3	PERCENT BOUND IN SPECIES #3300020	OH-
	2.6		PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	1.5		PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq

PC MINTEQA2 v3.10 PART 5 of OUTPUT FILE
 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:28

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.212E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	2.257E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	1.417E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	2.413E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	1.186E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	1.529E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
360	Hg2+2	9.971E-10	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	3.261E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
61	H3AsO4	2.670E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	3.995E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	2.907E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	1.203E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	4.421E-26	0.0	0.000E-01	0.0	7.281E-07	100.0
580	PO4-3	4.203E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	2.603E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	2.888E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.278E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
281	Fe+3	9.960E-16	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	5.059E-05	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 9.016E-04 Sum of ANIONS 1.313E-03

PERCENT DIFFERENCE = 1.858E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 1.444E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:28

ITERATIONS= 19: SOLID BA(ASO4)2 PRECIPITATES

 PART 3 of OUTPUT FILE

 PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:28

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
19	Zn+2	2.907E-06	-1.677E-07	-6.33390	1.674E-07
20	Zn+2	2.907E-06	1.660E-07	-6.29724	1.657E-07
21	Zn+2	2.907E-06	2.470E-09	-6.33296	2.179E-09
22	Sr+2	3.995E-06	7.617E-10	-5.47249	3.622E-10

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	6.166E-09	4.105E-09	-8.40517	0.958263	-1.382E-09
180	Cl-1	2.257E-05	2.257E-05	-4.66505	0.958263	3.969E-11
270	F-1	5.264E-06	1.411E-07	-6.86890	0.958263	-3.195E-09
600	Pb+2	2.413E-08	1.085E-10	-10.03846	0.843217	7.744E-15
30	Al+3	1.186E-05	3.850E-16	-15.58115	0.681339	2.003E-11
100	Ba+2	1.529E-06	1.129E-06	-6.02152	0.843217	7.940E-12
360	Hg2+2	9.971E-10	9.971E-10	-9.07531	0.843217	7.015E-15
460	Mg+2	3.291E-05	3.185E-05	-4.57098	0.843217	3.924E-11
90	H3BO3	1.203E-05	1.044E-05	-4.98132	1.000332	2.498E-12
800	Sr+2	3.995E-06	3.995E-06	-5.47257	0.843217	2.810E-11
950	Zn+2	2.907E-06	5.499E-07	-6.33379	0.843217	7.468E-12
2	H2O	-1.127E-19	-6.546E-04	-0.00001	1.000000	0.000E-01
140	CO3-2	6.799E-04	1.676E-05	-4.84967	0.843217	0.000E-01
580	PO4-3	5.265E-07	4.721E-12	-11.49263	0.681339	-3.516E-23
500	Na+1	2.610E-04	2.600E-04	-3.60351	0.958263	-2.316E-23
150	Ca+2	2.944E-04	2.811E-04	-3.62525	0.843217	1.348E-21
281	Fe+3	2.686E-06	8.854E-28	-27.21949	0.681339	0.000E-01
471	Mn+3	7.281E-07	4.422E-26	-25.52099	0.681339	0.000E-01
61	H3AsO4	2.670E-07	2.299E-21	-20.63823	1.000332	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	1.7	102.3	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		99.6	PERCENT BOUND IN SPECIES #	270 F-1
Pb+2	2.0	3.9	PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	93.1		PERCENT BOUND IN SPECIES #6003300	PbOH +
			PERCENT BOUND IN SPECIES #6001401	PbCO3 Aq
Al+3	3.6	96.4	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
			PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
Ba+2		100.0	PERCENT BOUND IN SPECIES #	100 Ba+2
Hg2+2		100.0	PERCENT BOUND IN SPECIES #	360 Hg2+2
Mg+2	1.1	97.7	PERCENT BOUND IN SPECIES #	460 Mg+2
	1.2		PERCENT BOUND IN SPECIES #4601400	MgCO3 Aq
			PERCENT BOUND IN SPECIES #4601401	MgHCO3 +
H3BO3	13.2	86.8	PERCENT BOUND IN SPECIES #	90 H3BO3
			PERCENT BOUND IN SPECIES #3300900	H2BO3 -1
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
Zn+2	4.6	18.9	PERCENT BOUND IN SPECIES #	950 Zn+2
	13.0		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	2.3		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
	45.0		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	16.1		PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq
			PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
H2O	90.4	5.3	PERCENT BOUND IN SPECIES #3300020	OH-
	2.6		PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	1.5		PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
CO3-2	97.0	1.3	PERCENT BOUND IN SPECIES #	140 CO3-2
			PERCENT BOUND IN SPECIES #3301400	HCO3 -
PO4-3	8.7	1.3	PERCENT BOUND IN SPECIES #4605802	MgHPO4 Aq
	5.4		PERCENT BOUND IN SPECIES #1505800	CaHPO4 Aq
	79.2		PERCENT BOUND IN SPECIES #1505801	CaPO4 -
	4.4		PERCENT BOUND IN SPECIES #3305800	HPO4 -2
			PERCENT BOUND IN SPECIES #3305801	H2PO4 -
Na+1		99.9	PERCENT BOUND IN SPECIES #	500 Na+1
Ca+2	1.1	97.3	PERCENT BOUND IN SPECIES #	150 Ca+2
	1.6		PERCENT BOUND IN SPECIES #1501400	CaHCO3 +
			PERCENT BOUND IN SPECIES #1501401	CaCO3 Aq
Fe+3	25.0	8.7	PERCENT BOUND IN SPECIES #2813301	FeOH2 +
	66.3		PERCENT BOUND IN SPECIES #2813302	FeOH3 Aq
			PERCENT BOUND IN SPECIES #2813303	FeOH4 -
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
H3AsO4	98.0	1.9	PERCENT BOUND IN SPECIES #3300611	H2AsO4 -
			PERCENT BOUND IN SPECIES #3300612	HAsO4 -2

PART 5 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:29

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.212E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	2.257E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	1.417E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	2.413E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	1.186E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	1.129E-06	73.8	0.000E-01	0.0	4.005E-07	26.2
360	Hg2+2	9.971E-10	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	3.261E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	1.203E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	3.995E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	2.907E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	5.059E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.278E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	4.202E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	2.603E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	2.889E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
281	Fe+3	9.959E-16	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	4.422E-26	0.0	0.000E-01	0.0	7.281E-07	100.0
61	H3AsO4	1.795E-13	0.0	0.000E-01	0.0	2.670E-07	100.0

Charge Balance: SPECIATED

Sum of CATIONS = 9.009E-04 Sum of ANIONS 1.312E-03

PERCENT DIFFERENCE = 1.860E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 1.443E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:29

ITERATIONS= 23: SOLID Hg2(OH)2 PRECIPITATES

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:29

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
23	Sr+2	3.995E-06	-6.263E-07	-5.47257	6.259E-07
24	Sr+2	3.995E-06	7.117E-07	-5.39852	7.113E-07
25	Sr+2	3.995E-06	2.554E-08	-5.46972	2.514E-08
26	Sr+2	3.995E-06	7.618E-10	-5.47249	3.623E-10

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	6.166E-09	4.105E-09	-8.40517	0.958263	-1.383E-09
180	Cl-1	2.257E-05	2.257E-05	-4.66505	0.958263	3.970E-11
270	F-1	5.264E-06	1.411E-07	-6.86890	0.958263	-3.195E-09
600	Pb+2	2.413E-08	1.085E-10	-10.03846	0.843217	7.746E-15
30	Al+3	1.186E-05	3.850E-16	-15.58115	0.681339	2.004E-11
100	Ba+2	1.529E-06	1.129E-06	-6.02152	0.843217	7.941E-12
950	Zn+2	2.907E-06	5.499E-07	-6.33379	0.843217	7.469E-12
460	Mg+2	3.291E-05	3.185E-05	-4.57098	0.843217	3.925E-11
90	H3BO3	1.203E-05	1.044E-05	-4.98132	1.000332	2.498E-12
800	Sr+2	3.995E-06	3.995E-06	-5.47257	0.843217	2.811E-11
360	Hg2+2	9.971E-10	3.342E-12	-11.55001	0.843217	0.000E-01
150	Ca+2	2.944E-04	2.811E-04	-3.62525	0.843217	1.631E-20
140	CO3-2	6.799E-04	1.676E-05	-4.84968	0.843217	0.000E-01
580	PO4-3	5.265E-07	4.721E-12	-11.49263	0.681339	4.235E-22
500	Na+1	2.610E-04	2.600E-04	-3.60350	0.958263	-5.206E-23
281	Fe+3	2.686E-06	8.854E-28	-27.21949	0.681339	0.000E-01
471	Mn+3	7.281E-07	4.422E-26	-25.52099	0.681339	0.000E-01
61	H3AsO4	2.670E-07	2.299E-21	-20.63822	1.000332	0.000E-01
2	H2O	-1.127E-19	-6.546E-04	-0.00001	1.000000	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	1.7	102.3	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		99.6	PERCENT BOUND IN SPECIES #	270 F-1
Pb+2	2.0	3.9	PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	93.1		PERCENT BOUND IN SPECIES #6003300	PbOH +
			PERCENT BOUND IN SPECIES #6001401	PbCO3 Aq
Al+3	3.6	96.4	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
			PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
Ba+2		100.0	PERCENT BOUND IN SPECIES #	100 Ba+2
Zn+2	4.6	18.9	PERCENT BOUND IN SPECIES #	950 Zn+2
	13.0		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	2.3		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
	45.0		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	16.1		PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq
			PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
Mg+2	1.1	97.7	PERCENT BOUND IN SPECIES #	460 Mg+2
	1.2		PERCENT BOUND IN SPECIES #4601400	MgCO3 Aq
			PERCENT BOUND IN SPECIES #4601401	MgHCO3 +
H3BO3	13.2	86.8	PERCENT BOUND IN SPECIES #	90 H3BO3
			PERCENT BOUND IN SPECIES #3300900	H2BO3 -1
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
Hg2+2		100.0	PERCENT BOUND IN SPECIES #	360 Hg2+2
Ca+2	1.1	97.3	PERCENT BOUND IN SPECIES #	150 Ca+2
	1.6		PERCENT BOUND IN SPECIES #1501400	CaHCO3 +
			PERCENT BOUND IN SPECIES #1501401	CaCO3 Aq
CO3-2	97.0	1.3	PERCENT BOUND IN SPECIES #	140 CO3-2
			PERCENT BOUND IN SPECIES #3301400	HCO3 -
PO4-3	8.7	1.3	PERCENT BOUND IN SPECIES #4605802	MgHPO4 Aq
	5.4		PERCENT BOUND IN SPECIES #1505800	CaHPO4 Aq
	79.2		PERCENT BOUND IN SPECIES #1505801	CaPO4 -
	4.4		PERCENT BOUND IN SPECIES #3305800	HPO4 -2
			PERCENT BOUND IN SPECIES #3305801	H2PO4 -
Na+1		99.9	PERCENT BOUND IN SPECIES #	500 Na+1
Fe+3	25.0	8.7	PERCENT BOUND IN SPECIES #2813301	FeOH2 +
	66.3		PERCENT BOUND IN SPECIES #2813302	FeOH3 Aq
			PERCENT BOUND IN SPECIES #2813303	FeOH4 -
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
H3AsO4	98.0	1.9	PERCENT BOUND IN SPECIES #3300611	H2AsO4 -
			PERCENT BOUND IN SPECIES #3300612	HAsO4 -2
H2O	90.4	5.3	PERCENT BOUND IN SPECIES #3300020	OH-
	2.6		PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	1.5		PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq

PC MINTEQA2 v3.10 PART 5 of OUTPUT FILE
 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:30

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.212E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	2.257E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	1.417E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	2.413E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	1.186E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	1.129E-06	73.8	0.000E-01	0.0	4.005E-07	26.2
950	Zn+2	2.907E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	3.261E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	1.203E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	3.995E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
360	Hg2+2	3.342E-12	0.3	0.000E-01	0.0	9.938E-10	99.7
150	Ca+2	2.889E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.278E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	4.202E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	2.603E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
281	Fe+3	9.959E-16	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	4.422E-26	0.0	0.000E-01	0.0	7.281E-07	100.0
61	H3AsO4	1.795E-13	0.0	0.000E-01	0.0	2.670E-07	100.0
2	H2O	5.059E-05	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 9.009E-04 Sum of ANIONS 1.312E-03

PERCENT DIFFERENCE = 1.860E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 1.443E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:30

ITERATIONS= 27: SOLID DIASPORE PRECIPITATES

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 24-SEP-96 TIME: 15:41:30

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
27	H3BO3	1.203E-05	-6.292E-08	-4.98132	6.171E-08
28	H3BO3	1.203E-05	6.027E-08	-4.97854	5.907E-08
29	H3BO3	1.203E-05	2.405E-09	-4.98146	1.203E-09
30	Ba+2	1.129E-06	2.153E-10	-6.02124	1.024E-10

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	6.166E-09	4.086E-09	-8.40718	0.958372	-1.357E-09
180	Cl-1	2.257E-05	2.257E-05	-4.66500	0.958372	3.986E-11
270	F-1	5.264E-06	1.417E-07	-6.86714	0.958372	-3.206E-09
600	Pb+2	2.413E-08	1.075E-10	-10.04257	0.843600	7.825E-15
800	Sr+2	3.995E-06	3.995E-06	-5.47237	0.843600	2.822E-11
100	Ba+2	1.529E-06	1.129E-06	-6.02132	0.843600	7.973E-12
950	Zn+2	2.907E-06	5.450E-07	-6.33750	0.843600	7.495E-12
460	Mg+2	3.291E-05	3.184E-05	-4.57085	0.843600	3.947E-11
90	H3BO3	1.203E-05	1.043E-05	-4.98158	1.000330	2.520E-12
30	Al+3	1.186E-05	6.572E-19	-18.34851	0.682036	0.000E-01
500	Na+1	2.610E-04	2.600E-04	-3.60345	0.958372	-4.855E-20
150	Ca+2	2.944E-04	2.783E-04	-3.62927	0.843600	-3.929E-23
140	CO3-2	6.799E-04	1.691E-05	-4.84566	0.843600	0.000E-01
580	PO4-3	5.265E-07	4.782E-12	-11.48660	0.682036	-7.329E-22
281	Fe+3	2.686E-06	8.723E-28	-27.22552	0.682036	0.000E-01
471	Mn+3	7.281E-07	4.357E-26	-25.52702	0.682036	0.000E-01
61	H3AsO4	2.670E-07	2.266E-21	-20.64455	1.000330	0.000E-01
360	Hg2+2	9.971E-10	3.310E-12	-11.55404	0.843600	0.000E-01
2	H2O	-1.127E-19	-6.399E-04	-0.00001	1.000000	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	1.7	98.5	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 AQ
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		99.6	PERCENT BOUND IN SPECIES #	270 F-1
Pb+2	2.0	4.0	PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	93.1		PERCENT BOUND IN SPECIES #6003300	PbOH +
			PERCENT BOUND IN SPECIES #6001401	PbCO3 AQ
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
Ba+2		100.0	PERCENT BOUND IN SPECIES #	100 Ba+2
Zn+2	4.6	18.7	PERCENT BOUND IN SPECIES #	950 Zn+2
	13.0		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	2.3		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 AQ
	45.0		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	16.3		PERCENT BOUND IN SPECIES #9501401	ZnCO3 AQ
			PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
Mg+2	1.1	97.6	PERCENT BOUND IN SPECIES #	460 Mg+2
	1.2		PERCENT BOUND IN SPECIES #4601400	MgCO3 AQ
			PERCENT BOUND IN SPECIES #4601401	MgHCO3 +
H3BO3	13.3	86.7	PERCENT BOUND IN SPECIES #	90 H3BO3
			PERCENT BOUND IN SPECIES #3300900	H2BO3 -1
Al+3	3.6	96.4	PERCENT BOUND IN SPECIES #	303302 Al(OH)4 -
			PERCENT BOUND IN SPECIES #	303303 Al(OH)3 AQ
Na+1		99.9	PERCENT BOUND IN SPECIES #	500 Na+1
Ca+2	1.1	97.3	PERCENT BOUND IN SPECIES #	150 Ca+2
	1.7		PERCENT BOUND IN SPECIES #1501400	CaHCO3 +
			PERCENT BOUND IN SPECIES #1501401	CaCO3 AQ
CO3-2	97.0	1.3	PERCENT BOUND IN SPECIES #	140 CO3-2
			PERCENT BOUND IN SPECIES #3301400	HCO3 -
PO4-3	8.6	1.3	PERCENT BOUND IN SPECIES #4605802	MgHPO4 AQ
	5.4		PERCENT BOUND IN SPECIES #1505800	CaHPO4 AQ
	79.3		PERCENT BOUND IN SPECIES #1505801	CaPO4 -
	4.4		PERCENT BOUND IN SPECIES #3305800	HPO4 -2
			PERCENT BOUND IN SPECIES #3305801	H2PO4 -
Fe+3	24.9	8.7	PERCENT BOUND IN SPECIES #2813301	FeOH2 +
	66.4		PERCENT BOUND IN SPECIES #2813302	FeOH3 AQ
			PERCENT BOUND IN SPECIES #2813303	FeOH4 -
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
H3AsO4	98.0	1.9	PERCENT BOUND IN SPECIES #3300611	H2AsO4 -
			PERCENT BOUND IN SPECIES #3300612	HAsO4 -2
Hg2+2		100.0	PERCENT BOUND IN SPECIES #	360 Hg2+2
H2O	2.2	72.8	PERCENT BOUND IN SPECIES #3300020	OH-
	3.7		PERCENT BOUND IN SPECIES #	303302 Al(OH)4 -
	20.6		PERCENT BOUND IN SPECIES #9503300	ZnOH +
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 AQ

 ----- EQUILIBRATED MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.264E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	2.257E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	1.422E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	2.413E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	3.995E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
100	Ba+2	1.129E-06	73.8	0.000E-01	0.0	4.005E-07	26.2
950	Zn+2	2.907E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	3.261E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	1.203E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	2.064E-08	0.2	0.000E-01	0.0	1.184E-05	99.8
500	Na+1	2.603E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	2.862E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.284E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
580	PO4-3	4.235E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
281	Fe+3	9.985E-16	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	4.357E-26	0.0	0.000E-01	0.0	7.281E-07	100.0
61	H3AsO4	1.784E-13	0.0	0.000E-01	0.0	2.670E-07	100.0
360	Hg2+2	3.310E-12	0.3	0.000E-01	0.0	9.938E-10	99.7
2	H2O	3.679E-06	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 8.954E-04 Sum of ANIONS 1.307E-03

PERCENT DIFFERENCE = 1.869E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

EQUILIBRIUM IONIC STRENGTH (m) = 1.434E-03

EQUILIBRIUM pH = 8.407

DATE ID NUMBER: 960924

TIME ID NUMBER: 15413141

EQUILIBRATION OF 1312 LEACHATE - SAMPLE W-2 BIOTITE GNEISS
 pCO2=10E-3.5; INFINITE CALCITE, HEMATITE, APATITE

25.00 MG/L 0.000 0.00000E-01

1 0 1 2 3 0 0 0 1 2 0 0 0

0 0 0

330	6.215E-06	-8.21 y	/H+1
180	8.000E-01	-4.29 y	/Cl-1
270	1.000E-01	-4.98 y	/F-1
580	5.000E-02	-6.68 y	/PO4-3
30	3.200E-01	-4.90 y	/Al+3
100	2.100E-01	-5.56 y	/Ba+2
150	1.180E+01	-3.46 y	/Ca+2
460	8.000E-01	-3.00 y	/Mg+2
500	6.000E+00	-3.46 y	/Na+1
800	3.500E-01	-5.62	/Sr+2
950	1.900E-01	-5.27 y	/Zn+2
90	7.436E-01	-4.64 y	/H3BO3
140	2.400E+01	-6.84 y	/Total CO3-2 alkali
61	3.790E-02	-6.87 y	/H3AsO4
600	5.000E-03	-7.09 y	/Pb+2

3 4

3301403	21.6600	-0.5300	/CO2 (g)
5015001	8.4750	2.5850	/CALCITE
7015003	44.1990	0.0000	/HYDRAPATITE
7015002	114.4000	-39.3900	/FCO3APATITE

6 2

5015000	8.3600	2.6150	/ARAGONITE
5015002	17.0000	8.2900	/DOLOMITE

APPENDIX F

MODEL OUTPUT FOR EQUILIBRATION OF 1320 LEACHATE - SAMPLE E-1 SERICITE GNEISS

EQUILIBRATION OF 1320 LEACHATE - EXTRACTION 1 - SAMPLE E-1 SERICITE GNEISS
pCO2=10E-3.5; INFINITE CALCITE; EXCLUDE ARAGONITE, DOLOMITE

Temperature (Celsius): 25.00
Units of concentration: MG/L
Ionic strength to be computed.
If specified, carbonate concentration represents total inorganic carbon.
Do not automatically terminate if charge imbalance exceeds 30%
Precipitation is allowed for all solids in the thermodynamic database and
the print option for solids is set to: 2
The maximum number of iterations is: 200
The method used to compute activity coefficients is: Davies equation
Abbreviated output file

330 5.720E+00 -5.45 y
140 1.248E+03 -3.00 y
180 3.400E+00 -4.02 y
270 1.000E-01 -5.28 y
492 1.900E+00 -4.51 y
732 4.000E+01 -3.38 y
30 1.100E-01 -5.39 y
150 6.890E+02 -1.76 y
212 3.000E-02 -6.59 y
231 1.300E-01 -5.69 y
600 4.000E-03 -7.71 y
460 4.900E+00 -3.70 y
471 7.370E+00 -3.87 y
410 2.200E+01 -3.25 y
500 1.000E+01 -3.36 y
800 1.500E+00 -4.77 y
950 1.300E+00 -4.70 y

H2O has been inserted as a COMPONENT

3 2
5015001 8.4750 2.5850
3301403 21.6600 -0.5300
6 2
5015000 8.3600 2.6150
5015002 17.0000 8.2900

Charge Balance: UNSPECIATED

Sum of CATIONS= 4.203E-02 Sum of ANIONS = 4.265E-02

PERCENT DIFFERENCE = 7.209E-01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

IMPROVED ACTIVITY GUESSES PRIOR TO FIRST ITERATION:
CO3-2 Log activity guess: -10.76
SO4-2 Log activity guess: -3.38
Al+3 Log activity guess: -6.49
CrO4-2 Log activity guess: -10.24
Cu+2 Log activity guess: -5.69

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 26-SEP-96 TIME: 11:12: 4

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
0	Na+1	4.359E-04	1.566E-06	-3.36000	1.523E-06
1	Pb+2	1.935E-08	4.503E-11	-7.81057	4.310E-11
2	Na+1	4.359E-04	1.172E-04	-3.36156	1.172E-04
3	Cu+2	2.050E-06	5.883E-09	-6.13764	5.678E-09
4	Na+1	4.359E-04	-1.872E-04	-3.46501	1.872E-04
5	Na+1	4.359E-04	3.432E-04	-3.22127	3.431E-04
6	Na+1	4.359E-04	3.037E-05	-3.47343	3.033E-05
7	Na+1	4.359E-04	-3.317E-05	-3.50250	3.312E-05
8	Na+1	4.359E-04	-4.562E-05	-3.46797	4.558E-05
9	Na+1	4.359E-04	-2.472E-05	-3.42002	2.468E-05
10	Na+1	4.359E-04	-3.166E-06	-3.39491	3.123E-06
11	Na+1	4.359E-04	-9.494E-07	-3.39172	9.058E-07
12	Na+1	4.359E-04	-1.482E-07	-3.39078	1.046E-07

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	5.686E-03	3.068E-09	-8.54187	0.935992	1.555E-10
800	Sr+2	1.715E-05	1.715E-05	-4.88055	0.767517	-1.309E-11
180	Cl-1	9.610E-05	9.610E-05	-4.04603	0.935992	-1.833E-11
270	F-1	5.274E-06	5.219E-06	-5.31118	0.935992	-1.006E-12
492	NO3-1	3.071E-05	3.071E-05	-4.54152	0.935992	-5.856E-12
732	SO4-2	4.172E-04	3.995E-04	-3.51336	0.767517	-3.051E-10
30	Al+3	4.085E-06	4.606E-17	-16.59518	0.551376	-7.576E-13
950	Zn+2	1.993E-05	2.043E-06	-5.80460	0.767517	-6.357E-12
212	CrO4-2	2.592E-07	2.561E-07	-6.70651	0.767517	-1.960E-13
231	Cu+2	2.050E-06	9.959E-10	-9.11670	0.767517	5.677E-15
600	Pb+2	1.935E-08	4.931E-11	-10.42201	0.767517	-1.161E-15
460	Mg+2	2.020E-04	1.874E-04	-3.84205	0.767517	-1.435E-10
471	Mn+3	1.344E-04	1.344E-04	-4.13007	0.551376	-2.307E-10
410	K+1	5.638E-04	5.626E-04	-3.27855	0.935992	-1.075E-10
500	Na+1	4.359E-04	4.346E-04	-3.39063	0.935992	-8.306E-11
140	CO3-2	2.084E-02	3.454E-05	-4.57660	0.767517	0.000E-01
150	Ca+2	1.723E-02	1.647E-04	-3.89833	0.767517	0.000E-01
2	H2O	0.000E-01	1.946E-03	-0.00034	1.000000	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	100.1	PERCENT BOUND IN SPECIES #3301400	HCO3 -
	1.2	PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
Sr+2	100.0	PERCENT BOUND IN SPECIES # 800	Sr+2
Cl-1	100.0	PERCENT BOUND IN SPECIES # 180	Cl-1
F-1	98.9	PERCENT BOUND IN SPECIES # 270	F-1
NO3-1	100.0	PERCENT BOUND IN SPECIES # 492	NO3-1
SO4-2	95.8	PERCENT BOUND IN SPECIES # 732	SO4-2
	1.9	PERCENT BOUND IN SPECIES #4607320	MgSO4 Aq
	1.9	PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq
Al+3	97.4	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	2.6	PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
Zn+2	10.3	PERCENT BOUND IN SPECIES # 950	Zn+2
	3.2	PERCENT BOUND IN SPECIES #9503300	ZnOH +
	12.0	PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
	1.6	PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	41.6	PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq
	30.7	PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
CrO4-2	98.8	PERCENT BOUND IN SPECIES # 212	CrO4-2
Cu+2	5.3	PERCENT BOUND IN SPECIES #2311400	CuCO3 Aq
	94.2	PERCENT BOUND IN SPECIES #2313301	Cu(OH)2 Aq
Pb+2	7.8	PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	1.4	PERCENT BOUND IN SPECIES #6003300	PbOH +
	90.0	PERCENT BOUND IN SPECIES #6001401	PbCO3 Aq
Mg+2	92.8	PERCENT BOUND IN SPECIES # 460	Mg+2
	1.8	PERCENT BOUND IN SPECIES #4601400	MgCO3 Aq
	1.4	PERCENT BOUND IN SPECIES #4601401	MgHCO3 +
	3.9	PERCENT BOUND IN SPECIES #4607320	MgSO4 Aq
Mn+3	100.0	PERCENT BOUND IN SPECIES # 471	Mn+3
K+1	99.8	PERCENT BOUND IN SPECIES # 410	K+1
Na+1	99.7	PERCENT BOUND IN SPECIES # 500	Na+1
CO3-2	1.9	PERCENT BOUND IN SPECIES # 140	CO3-2
	95.6	PERCENT BOUND IN SPECIES #3301400	HCO3 -
Ca+2	91.7	PERCENT BOUND IN SPECIES # 150	Ca+2
	1.3	PERCENT BOUND IN SPECIES #1501400	CaHCO3 +
	2.6	PERCENT BOUND IN SPECIES #1501401	CaCO3 Aq
	4.4	PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq
H2O	12.7	PERCENT BOUND IN SPECIES #3300020	OH-
	54.2	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	1.1	PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq
	13.2	PERCENT BOUND IN SPECIES #2313301	Cu(OH)2 Aq
	2.2	PERCENT BOUND IN SPECIES #9503300	ZnOH +
	16.3	PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq

PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.735E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.715E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	9.610E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	5.274E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
492	NO3-1	3.071E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	4.172E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	4.085E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	1.993E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
212	CrO4-2	2.592E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
231	Cu+2	2.050E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	1.935E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.020E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	1.344E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
410	K+1	5.638E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	4.359E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.817E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	1.796E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	2.937E-05	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 2.149E-03 Sum of ANIONS 2.760E-03

PERCENT DIFFERENCE = 1.244E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 3.670E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 26-SEP-96 TIME: 11:12: 5

ITERATIONS= 14: SOLID BIXBYITE PRECIPITATES

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 26-SEP-96 TIME: 11:12: 5

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
14	K+1	5.638E-04	-3.609E-05	-3.27855	3.603E-05
15	K+1	5.638E-04	3.415E-05	-3.25007	3.410E-05
16	K+1	5.638E-04	9.206E-07	-3.27536	8.643E-07
17	Mg+2	2.020E-04	2.353E-08	-3.82988	3.333E-09

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	5.686E-03	3.565E-09	-8.47421	0.941377	-9.818E-12
800	Si+2	1.715E-05	1.715E-05	-4.87058	0.785334	5.949E-11
180	Cl-1	9.610E-05	9.609E-05	-4.04354	0.941377	8.332E-11
270	F-1	5.274E-06	5.215E-06	-5.30898	0.941377	4.573E-12
492	NO3-1	3.071E-05	3.071E-05	-4.53902	0.941377	2.662E-11
732	SO4-2	4.172E-04	3.961E-04	-3.50717	0.785334	1.375E-09
30	Al+3	4.085E-06	8.167E-17	-16.32408	0.580594	3.431E-12
950	Zn+2	1.993E-05	2.849E-06	-5.65019	0.785334	2.654E-11
212	CrO4-2	2.592E-07	2.557E-07	-6.69720	0.785334	8.898E-13
231	Cu+2	2.050E-06	1.329E-09	-8.98137	0.785334	-2.374E-14
600	Pb+2	1.935E-08	6.704E-11	-10.27864	0.785334	4.008E-15
460	Mg+2	2.020E-04	1.884E-04	-3.82993	0.785334	6.555E-10
500	Na+1	4.359E-04	4.347E-04	-3.38804	0.941377	3.776E-10
410	K+1	5.638E-04	5.625E-04	-3.27608	0.941377	4.888E-10
471	Mn+3	1.344E-04	3.225E-26	-25.72764	0.580594	-1.400E-19
150	Ca+2	1.723E-02	2.197E-04	-3.76302	0.785334	0.000E-01
140	CO3-2	2.084E-02	2.472E-05	-4.71191	0.785334	0.000E-01
2	H2O	0.000E-01	2.076E-03	-0.00034	1.000000	-1.355E-20

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	100.2	PERCENT BOUND IN SPECIES #3301400	HCO3 -
1.4	PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq	
Sr+2	100.0	PERCENT BOUND IN SPECIES # 800	Sr+2
Cl-1	100.0	PERCENT BOUND IN SPECIES # 180	Cl-1
F-1	98.9	PERCENT BOUND IN SPECIES # 270	F-1
NO3-1	100.0	PERCENT BOUND IN SPECIES # 492	NO3-1
SO4-2	94.9	PERCENT BOUND IN SPECIES # 732	SO4-2
2.0	PERCENT BOUND IN SPECIES #4607320	MgSO4 Aq	
2.6	PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq	
Al+3	96.9	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
3.1	PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq	
Zn+2	14.3	PERCENT BOUND IN SPECIES # 950	Zn+2
3.9	PERCENT BOUND IN SPECIES #9503300	ZnOH +	
12.6	PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq	
2.0	PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +	
43.5	PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq	
23.0	PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2	
CrO4-2	98.7	PERCENT BOUND IN SPECIES # 212	CrO4-2
Cu+2	5.3	PERCENT BOUND IN SPECIES #2311400	CuCO3 Aq
94.3	PERCENT BOUND IN SPECIES #2313301	Cu(OH)2 Aq	
Pb+2	5.7	PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
1.7	PERCENT BOUND IN SPECIES #6003300	PbOH +	
91.7	PERCENT BOUND IN SPECIES #6001401	PbCO3 Aq	
Mg+2	93.3	PERCENT BOUND IN SPECIES # 460	Mg+2
1.4	PERCENT BOUND IN SPECIES #4601400	MgCO3 Aq	
1.3	PERCENT BOUND IN SPECIES #4601401	MgHCO3 +	
4.0	PERCENT BOUND IN SPECIES #4607320	MgSO4 Aq	
Na+1	99.7	PERCENT BOUND IN SPECIES # 500	Na+1
K+1	99.8	PERCENT BOUND IN SPECIES # 410	K+1
Mn+3	100.0	PERCENT BOUND IN SPECIES # 471	Mn+3
Ca+2	92.3	PERCENT BOUND IN SPECIES # 150	Ca+2
1.1	PERCENT BOUND IN SPECIES #1501400	CaHCO3 +	
2.0	PERCENT BOUND IN SPECIES #1501401	CaCO3 Aq	
4.6	PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq	
CO3-2	1.6	PERCENT BOUND IN SPECIES # 140	CO3-2
95.7	PERCENT BOUND IN SPECIES #3301400	HCO3 -	
H2O	10.9	PERCENT BOUND IN SPECIES #3300020	OH-
54.4	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -	
1.3	PERCENT BOUND IN SPECIES # 303303	Al(OH)3 Aq	
13.3	PERCENT BOUND IN SPECIES #2313301	Cu(OH)2 Aq	
2.7	PERCENT BOUND IN SPECIES #9503300	ZnOH +	
17.2	PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq	

PART 5 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 26-SEP-96 TIME: 11:12: 6

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.476E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.715E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	9.610E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	5.274E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
492	NO3-1	3.071E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	4.173E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	4.085E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	1.993E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
212	CrO4-2	2.592E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
231	Cu+2	2.050E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	1.935E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.020E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	4.359E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
410	K+1	5.638E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	3.225E-26	0.0	0.000E-01	0.0	1.344E-04	100.0
150	Ca+2	2.381E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.545E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	2.914E-05	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 1.860E-03 Sum of ANIONS 2.471E-03

PERCENT DIFFERENCE = 1.410E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 3.019E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 26-SEP-96 TIME: 11:12: 6

ITERATIONS= 18: SOLID DIASPORE PRECIPITATES

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 26-SEP-96 TIME: 11:12: 6

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVITY	RESIDUAL
18	Na+1	4.359E-04	-2.553E-05	-3.38804	2.549E-05
19	Na+1	4.359E-04	2.636E-05	-3.36199	2.631E-05
20	Na+1	4.359E-04	7.183E-07	-3.38731	6.747E-07
21	Mg+2	2.020E-04	2.372E-08	-3.82988	3.529E-09

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVITY	GAMMA	DIFF FXN
330	H+1	5.686E-03	3.559E-09	-8.47489	0.941395	-3.619E-12
800	Sr+2	1.715E-05	1.715E-05	-4.87055	0.785394	5.992E-11
180	Cl-1	9.610E-05	9.609E-05	-4.04353	0.941395	8.392E-11
270	F-1	5.274E-06	5.215E-06	-5.30897	0.941395	4.606E-12
492	NO3-1	3.071E-05	3.071E-05	-4.53902	0.941395	2.681E-11
732	SO4-2	4.172E-04	3.961E-04	-3.50710	0.785394	1.385E-09
410	K+1	5.638E-04	5.625E-04	-3.27607	0.941395	4.924E-10
950	Zn+2	1.993E-05	2.840E-06	-5.65159	0.785394	2.675E-11
212	CrO4-2	2.592E-07	2.557E-07	-6.69716	0.785394	8.963E-13
231	Cu+2	2.050E-06	1.325E-09	-8.98271	0.785394	-2.388E-14
600	Pb+2	1.935E-08	6.682E-11	-10.28003	0.785394	4.048E-15
460	Mg+2	2.020E-04	1.884E-04	-3.82993	0.785394	6.602E-10
500	Na+1	4.359E-04	4.347E-04	-3.38803	0.941395	3.804E-10
30	Al+3	4.085E-06	4.843E-19	-18.55098	0.580693	0.000E-01
150	Ca+2	1.723E-02	2.191E-04	-3.76436	0.785394	0.000E-01
140	CO3-2	2.084E-02	2.479E-05	-4.71057	0.785394	0.000E-01
471	Mn+3	1.344E-04	3.209E-26	-25.72965	0.580693	0.000E-01
2	H2O	0.000E-01	2.081E-03	-0.00034	1.000000	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	1.4	99.1	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 AQ
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		98.9	PERCENT BOUND IN SPECIES #	270 F-1
NO3-1		100.0	PERCENT BOUND IN SPECIES #	492 NO3-1
SO4-2	2.0	94.9	PERCENT BOUND IN SPECIES #	732 SO4-2
	2.6		PERCENT BOUND IN SPECIES #4607320	MgSO4 AQ
			PERCENT BOUND IN SPECIES #1507320	CaSO4 AQ
K+1		99.8	PERCENT BOUND IN SPECIES #	410 K+1
Zn+2		14.3	PERCENT BOUND IN SPECIES #	950 Zn+2
	3.9		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	12.6		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 AQ
	1.9		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	43.5		PERCENT BOUND IN SPECIES #9501401	ZnCO3 AQ
	23.1		PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
CrO4-2		98.7	PERCENT BOUND IN SPECIES #	212 CrO4-2
Cu+2	94.3	5.3	PERCENT BOUND IN SPECIES #2311400	CuCO3 AQ
			PERCENT BOUND IN SPECIES #2313301	Cu(OH)2 AQ
Pb+2		5.7	PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	1.7		PERCENT BOUND IN SPECIES #6003300	PbOH +
	91.7		PERCENT BOUND IN SPECIES #6001401	PbCO3 AQ
Mg+2		93.3	PERCENT BOUND IN SPECIES #	460 Mg+2
	1.4		PERCENT BOUND IN SPECIES #4601400	MgCO3 AQ
	1.3		PERCENT BOUND IN SPECIES #4601401	MgHCO3 +
	4.0		PERCENT BOUND IN SPECIES #4607320	MgSO4 AQ
Na+1		99.7	PERCENT BOUND IN SPECIES #	500 Na+1
Al+3	3.1	96.9	PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
			PERCENT BOUND IN SPECIES # 303303	Al(OH)3 AQ
Ca+2		92.3	PERCENT BOUND IN SPECIES #	150 Ca+2
	1.1		PERCENT BOUND IN SPECIES #1501400	CaHCO3 +
	2.0		PERCENT BOUND IN SPECIES #1501401	CaCO3 AQ
	4.6		PERCENT BOUND IN SPECIES #1507320	CaSO4 AQ
CO3-2	95.7	1.6	PERCENT BOUND IN SPECIES #	140 CO3-2
			PERCENT BOUND IN SPECIES #3301400	HCO3 -
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
H2O		24.4	PERCENT BOUND IN SPECIES #3300020	OH-
	29.7		PERCENT BOUND IN SPECIES #2313301	Cu(OH)2 AQ
	5.9		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	38.4		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 AQ

PART 5 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 26-SEP-96 TIME: 11:12: 7

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.494E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.715E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	9.610E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	5.274E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
492	NO3-1	3.071E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	4.173E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
410	K+1	5.638E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	1.993E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
212	CrO4-2	2.592E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
231	Cu+2	2.050E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	1.935E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.020E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	4.359E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
30	Al+3	2.438E-08	0.6	0.000E-01	0.0	4.061E-06	99.4
150	Ca+2	2.374E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.547E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	3.209E-26	0.0	0.000E-01	0.0	1.344E-04	100.0
2	H2O	1.303E-05	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 1.859E-03 Sum of ANIONS 2.469E-03

PERCENT DIFFERENCE = 1.411E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 3.017E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 26-SEP-96 TIME: 11:12: 7

ITERATIONS= 22: SOLID TENORITE PRECIPITATES

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
22	Mg+2	2.020E-04	-4.057E-05	-3.82993	4.055E-05
23	Mg+2	2.020E-04	4.920E-05	-3.73703	4.918E-05
24	Mg+2	2.020E-04	1.699E-06	-3.82637	1.679E-06
25	Mg+2	2.020E-04	2.372E-08	-3.82988	3.528E-09

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	5.686E-03	3.559E-09	-8.47489	0.941395	-3.661E-12
800	SR+2	1.715E-05	1.715E-05	-4.87055	0.785394	5.992E-11
180	CL-1	9.610E-05	9.609E-05	-4.04353	0.941395	8.392E-11
270	F-1	5.274E-06	5.215E-06	-5.30897	0.941395	4.606E-12
492	NO3-1	3.071E-05	3.071E-05	-4.53902	0.941395	2.681E-11
732	SO4-2	4.172E-04	3.961E-04	-3.50710	0.785394	1.385E-09
410	K+1	5.638E-04	5.625E-04	-3.27607	0.941395	4.923E-10
950	Zn+2	1.993E-05	2.840E-06	-5.65159	0.785394	2.674E-11
212	CR04-2	2.592E-07	2.557E-07	-6.69716	0.785394	8.962E-13
500	Na+1	4.359E-04	4.347E-04	-3.38803	0.941395	3.803E-10
600	Pb+2	1.935E-08	6.682E-11	-10.28003	0.785394	4.047E-15
460	Mg+2	2.020E-04	1.884E-04	-3.82993	0.785394	6.601E-10
231	Cu+2	2.050E-06	5.963E-10	-9.32943	0.785394	0.000E-01
150	Ca+2	1.723E-02	2.191E-04	-3.76436	0.785394	0.000E-01
140	CO3-2	2.084E-02	2.479E-05	-4.71057	0.785394	0.000E-01
471	Mn+3	1.344E-04	3.209E-26	-25.72965	0.580694	0.000E-01
30	Al+3	4.085E-06	4.843E-19	-18.55098	0.580694	0.000E-01
2	H2O	0.000E-01	2.082E-03	-0.00034	1.000000	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	1.4	98.9	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 Aq
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		98.9	PERCENT BOUND IN SPECIES #	270 F-1
NO3-1		100.0	PERCENT BOUND IN SPECIES #	492 NO3-1
SO4-2	2.0	94.9	PERCENT BOUND IN SPECIES #	732 SO4-2
	2.6		PERCENT BOUND IN SPECIES #4607320	MgSO4 Aq
			PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq
K+1		99.8	PERCENT BOUND IN SPECIES #	410 K+1
Zn+2	3.9	14.3	PERCENT BOUND IN SPECIES #	950 Zn+2
	12.6		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	1.9		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq
	43.5		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	23.1		PERCENT BOUND IN SPECIES #9501401	ZnCO3 Aq
			PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
CrO4-2		98.7	PERCENT BOUND IN SPECIES #	212 CrO4-2
Na+1		99.7	PERCENT BOUND IN SPECIES #	500 Na+1
Pb+2	1.7	5.7	PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	91.7		PERCENT BOUND IN SPECIES #6003300	PbOH +
			PERCENT BOUND IN SPECIES #6001401	PbCO3 Aq
Mg+2	1.4	93.3	PERCENT BOUND IN SPECIES #	460 Mg+2
	1.3		PERCENT BOUND IN SPECIES #4601400	MgCO3 Aq
	4.0		PERCENT BOUND IN SPECIES #4601401	MgHCO3 +
			PERCENT BOUND IN SPECIES #4607320	MgSO4 Aq
Cu+2	94.3	5.3	PERCENT BOUND IN SPECIES #2311400	CuCO3 Aq
			PERCENT BOUND IN SPECIES #2313301	Cu(OH)2 Aq
Ca+2	1.1	92.3	PERCENT BOUND IN SPECIES #	150 Ca+2
	2.0		PERCENT BOUND IN SPECIES #1501400	CaHCO3 +
	4.6		PERCENT BOUND IN SPECIES #1501401	CaCO3 Aq
			PERCENT BOUND IN SPECIES #1507320	CaSO4 Aq
CO3-2	95.7	1.6	PERCENT BOUND IN SPECIES #	140 CO3-2
			PERCENT BOUND IN SPECIES #3301400	HCO3 -
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
Al+3	3.1	96.9	PERCENT BOUND IN SPECIES #	303302 Al(OH)4 -
			PERCENT BOUND IN SPECIES #	303303 Al(OH)3 Aq
H2O	16.0	29.2	PERCENT BOUND IN SPECIES #3300020	OH-
	7.1		PERCENT BOUND IN SPECIES #2313301	Cu(OH)2 Aq
	45.9		PERCENT BOUND IN SPECIES #9503300	ZnOH +
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 Aq

PART 5 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 26-SEP-96 TIME: 11:12: 8

 ----- PROVISIONAL MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.496E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.715E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	9.610E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	5.274E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
492	NO3-1	3.071E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	4.173E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
410	K+1	5.638E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	1.993E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
212	CrO4-2	2.592E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	4.359E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	1.935E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.020E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
231	Cu+2	9.226E-07	45.0	0.000E-01	0.0	1.127E-06	55.0
150	Ca+2	2.374E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.547E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	3.209E-26	0.0	0.000E-01	0.0	1.344E-04	100.0
30	Al+3	2.438E-08	0.6	0.000E-01	0.0	4.061E-06	99.4
2	H2O	1.090E-05	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 1.859E-03 Sum of ANIONS 2.469E-03

PERCENT DIFFERENCE = 1.411E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

PROVISIONAL IONIC STRENGTH (m) = 3.017E-03

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 26-SEP-96 TIME: 11:12: 8

ITERATIONS= 26: SOLID ZINCITE PRECIPITATES

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 26-SEP-96 TIME: 11:12: 9

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
26	Pb+2	1.935E-08	-2.617E-10	-10.28003	2.598E-10
27	Pb+2	1.935E-08	2.605E-10	-10.27745	2.586E-10
28	Pb+2	1.935E-08	9.147E-12	-10.28007	7.212E-12
29	CrO4-2	2.592E-07	3.185E-11	-6.69703	5.930E-12

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
330	H+1	5.686E-03	3.558E-09	-8.47499	0.941437	5.247E-11
800	Sr+2	1.715E-05	1.715E-05	-4.87047	0.785534	6.057E-11
180	Cl-1	9.610E-05	9.610E-05	-4.04351	0.941437	8.483E-11
270	F-1	5.274E-06	5.215E-06	-5.30895	0.941437	4.656E-12
492	NO3-1	3.071E-05	3.071E-05	-4.53900	0.941437	2.710E-11
732	SO4-2	4.172E-04	3.962E-04	-3.50697	0.785534	1.400E-09
410	K+1	5.638E-04	5.625E-04	-3.27605	0.941437	4.977E-10
460	Mg+2	2.020E-04	1.884E-04	-3.82987	0.785534	6.673E-10
212	CrO4-2	2.592E-07	2.557E-07	-6.69709	0.785534	9.059E-13
500	Na+1	4.359E-04	4.347E-04	-3.38801	0.941437	3.845E-10
600	Pb+2	1.935E-08	6.677E-11	-10.28025	0.785534	4.092E-15
950	Zn+2	1.993E-05	1.973E-06	-5.80964	0.785534	0.000E-01
150	Ca+2	1.723E-02	2.189E-04	-3.76457	0.785534	0.000E-01
140	CO3-2	2.084E-02	2.480E-05	-4.71036	0.785534	0.000E-01
471	Mn+3	1.344E-04	3.206E-26	-25.72997	0.580926	0.000E-01
30	Al+3	4.085E-06	4.837E-19	-18.55130	0.580926	0.000E-01
231	Cu+2	2.050E-06	5.959E-10	-9.32964	0.785534	0.000E-01
2	H2O	0.000E-01	2.083E-03	-0.00034	1.000000	0.000E-01

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

H+1	1.4	98.8	PERCENT BOUND IN SPECIES #3301400	HCO3 -
			PERCENT BOUND IN SPECIES #3301401	H2CO3 AQ
Sr+2		100.0	PERCENT BOUND IN SPECIES #	800 Sr+2
Cl-1		100.0	PERCENT BOUND IN SPECIES #	180 Cl-1
F-1		98.9	PERCENT BOUND IN SPECIES #	270 F-1
NO3-1		100.0	PERCENT BOUND IN SPECIES #	492 NO3-1
SO4-2	2.0	94.9	PERCENT BOUND IN SPECIES #	732 SO4-2
	2.6		PERCENT BOUND IN SPECIES #4607320	MgSO4 AQ
			PERCENT BOUND IN SPECIES #1507320	CaSO4 AQ
K+1		99.8	PERCENT BOUND IN SPECIES #	410 K+1
Mg+2	1.4	93.3	PERCENT BOUND IN SPECIES #	460 Mg+2
	1.3		PERCENT BOUND IN SPECIES #4601400	MgCO3 AQ
	4.1		PERCENT BOUND IN SPECIES #4601401	MgHCO3 +
			PERCENT BOUND IN SPECIES #4607320	MgSO4 AQ
CrO4-2		98.7	PERCENT BOUND IN SPECIES #	212 CrO4-2
Na+1		99.7	PERCENT BOUND IN SPECIES #	500 Na+1
Pb+2	1.7	5.7	PERCENT BOUND IN SPECIES #6001400	Pb(CO3)2-2
	91.7		PERCENT BOUND IN SPECIES #6003300	PbOH +
			PERCENT BOUND IN SPECIES #6001401	PbCO3 AQ
Zn+2	3.9	14.2	PERCENT BOUND IN SPECIES #	950 Zn+2
	12.6		PERCENT BOUND IN SPECIES #9503300	ZnOH +
	1.9		PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 AQ
	43.5		PERCENT BOUND IN SPECIES #9501400	ZnHCO3 +
	23.1		PERCENT BOUND IN SPECIES #9501401	ZnCO3 AQ
			PERCENT BOUND IN SPECIES #9501402	Zn(CO3)2-2
Ca+2	1.1	92.3	PERCENT BOUND IN SPECIES #	150 Ca+2
	2.0		PERCENT BOUND IN SPECIES #1501400	CaHCO3 +
	4.6		PERCENT BOUND IN SPECIES #1501401	CaCO3 AQ
			PERCENT BOUND IN SPECIES #1507320	CaSO4 AQ
CO3-2	96.0	1.6	PERCENT BOUND IN SPECIES #	140 CO3-2
			PERCENT BOUND IN SPECIES #3301400	HCO3 -
Mn+3		100.0	PERCENT BOUND IN SPECIES #	471 Mn+3
Al+3	3.1	96.9	PERCENT BOUND IN SPECIES #	303302 Al(OH)4 -
			PERCENT BOUND IN SPECIES # 303303	Al(OH)3 AQ
Cu+2	94.3	5.3	PERCENT BOUND IN SPECIES #2311400	CuCO3 AQ
			PERCENT BOUND IN SPECIES #2313301	Cu(OH)2 AQ
H2O	1.0	34.8	PERCENT BOUND IN SPECIES #3300020	OH-
	19.0		PERCENT BOUND IN SPECIES # 303302	Al(OH)4 -
	5.9		PERCENT BOUND IN SPECIES #2313301	Cu(OH)2 AQ
	38.1		PERCENT BOUND IN SPECIES #9503300	ZnOH +
			PERCENT BOUND IN SPECIES #9503301	Zn(OH)2 AQ

 ----- EQUILIBRATED MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
330	H+1	1.498E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.715E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	9.610E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	5.274E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
492	NO3-1	3.071E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	4.173E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
410	K+1	5.638E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	2.020E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
212	CrO4-2	2.592E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	4.359E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
600	Pb+2	1.935E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	1.385E-05	69.5	0.000E-01	0.0	6.073E-06	30.5
150	Ca+2	2.372E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.542E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
471	Mn+3	3.206E-26	0.0	0.000E-01	0.0	1.344E-04	100.0
30	Al+3	2.438E-08	0.6	0.000E-01	0.0	4.061E-06	99.4
231	Cu+2	9.226E-07	45.0	0.000E-01	0.0	1.127E-06	55.0
2	H2O	9.136E-06	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 1.856E-03 Sum of ANIONS 2.467E-03

PERCENT DIFFERENCE = 1.412E+01 (ANIONS - CATIONS)/(ANIONS + CATIONS)

EQUILIBRIUM IONIC STRENGTH (m) = 3.012E-03

EQUILIBRIUM pH = 8.475

DATE ID NUMBER: 960926

TIME ID NUMBER: 11120997

EQUILIBRATION OF 1320 LEACHATE - EXTRACTION 1 - SAMPLE E-1 SERICITE GNEISS
pCO2=10E-3.5; INFINITE CALCITE; EXCLUDE ARAGONITE, DOLOMITE

25.00 MG/L 0.000 0.00000E-01

0 0 1 2 3 0 0 0 1 2 0 0 0

0 0 0

330	5.720E+00	-5.45 y	/H+1
140	1.248E+03	-3.00 y	/TOTAL CARBON, CO3
180	3.400E+00	-4.02 y	/Cl-1
270	1.000E-01	-5.28 y	/F-1
492	1.900E+00	-4.51 y	/NO3-1
732	4.000E+01	-3.38 y	/SO4-2
30	1.100E-01	-5.39 y	/Al+3
150	6.890E+02	-1.76 y	/Ca+2
212	3.000E-02	-6.59 y	/CrO4-2
231	1.300E-01	-5.69 y	/Cu+2
600	4.000E-03	-7.71 y	/Pb+2
460	4.900E+00	-3.70 y	/Mg+2
471	7.370E+00	-3.87 y	/Mn+3
410	2.200E+01	-3.25 y	/K+1
500	1.000E+01	-3.36 y	/Na+1
800	1.500E+00	-4.77 y	/Sr+2
950	1.300E+00	-4.70 y	/Zn+2

3 2

5015001	8.4750	2.5850	/CALCITE
3301403	21.6600	-0.5300	/CO2 (g)

6 2

5015000	8.3600	2.6150	/ARAGONITE
5015002	17.0000	8.2900	/DOLOMITE

APPENDIX E-2

**SUPPLEMENT TO HYDROLOGY BASELINE REPORT
FOR THE IMPERIAL PROJECT
IMPERIAL COUNTY, CALIFORNIA**

CHEMGOLD, INC. IMPERIAL PROJECT
IMPERIAL COUNTY, CALIFORNIA

SUPPLEMENTAL HYDROLOGY STUDY FOR THE IMPERIAL PROJECT
IMPERIAL COUNTY, CALIFORNIA

EMA Report No. 1093-01
September 1996

Prepared for:

Chemgold, Inc.
P.O. Box 758
Winterhaven, California 92283

CHEMGOLD, INC. IMPERIAL PROJECT
IMPERIAL COUNTY, CALIFORNIA

SUPPLEMENTAL HYDROLOGY STUDY

EMA Report No. 1093-01
September 1996

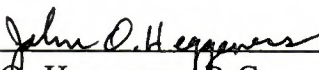
Prepared for:

Chemgold, Inc.
P.O. Box 758
Winterhaven, California 92283

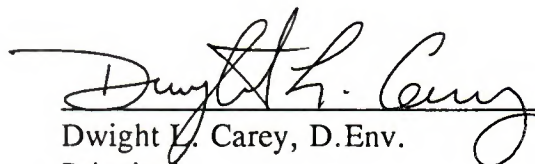
LIMITATIONS

This report was prepared by Environmental Management Associates, Inc. (EMA) in conformance with the scope of work prescribed by our CLIENT. The work has been conducted in an objective and unbiased manner and in accord with generally accepted professional practice for this type of work. No other warranty, either expressed or implied, is made as to the findings, recommendations, specifications or opinions presented herein.

ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.



John O. Heggeness, R.G.
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**CHEMGOLD, INC. IMPERIAL PROJECT
IMPERIAL COUNTY, CALIFORNIA
SUPPLEMENTAL HYDROLOGY STUDY**

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APPENDIX B - ANALYTICAL RESULTS OF AUGUST 1996
SAMPLING

CHEMGOLD, INC. IMPERIAL PROJECT IMPERIAL COUNTY, CALIFORNIA

SUPPLEMENTAL HYDROLOGY STUDY

1. INTRODUCTION

Chemgold, Inc. has proposed the development of a conventional open-pit, heap leach, precious metal mine, the Imperial Project (Project), to be located in eastern Imperial County, California, approximately 45 miles northeast of El Centro, California and 20 miles northwest of Yuma, Arizona. The Project would be located south of State Route 78 and north of Interstate Highway 8, and would be accessed via Ogilby Road and Indian Pass Road (Figure 1). A joint Draft Environmental Impact Statement and Environmental Impact Report (EIS/EIR) is being prepared by the Bureau of Land Management (BLM) office in El Centro, California and the Imperial County Planning/Building Department.

In support of this EIS/EIR, WESTEC, Inc. prepared, in February 1996, a report entitled "Hydrology Baseline Report of the Imperial Project, Imperial County California" (WESTEC Report). Following the publication of the WESTEC Report, additional hydrogeologic data regarding Chemgold, Inc.'s proposed Imperial Project (Project) was generated by Chemgold, and certain additional questions regarding the area hydrogeology were raised. This report supplements the WESTEC Report and documents that additional hydrogeologic information developed by Chemgold, presents the results of water sampling and analyses conducted by Environmental Management Associates, Inc. (EMA) since the publication of the WESTEC Report, and utilizes this information to supplement some of the discussions presented in the WESTEC Report.

This report contains the following:

- Documentation of the analyses of the two (2) Project monitoring wells, MW-1 and MW-2, and two (2) Project core holes, EC-5 and WC-5, conducted by Chemgold subsequent to the publication of the WESTEC Report;
- Documentation of the sampling and analyses of MW-1, MW-2, EC-5 and WC-5 conducted by EMA subsequent to the publication of the WESTEC Report, as well as sampling and analyses of water from the existing Gold Rock Ranch well and Imperial Irrigation District's (IID's) All American Canal;
- A discussion of the methods used for constructing monitoring well MW-2 and information regarding the physical characteristics of the other Project wells and coreholes;
- A short discussion of the monitoring program requirements of the California Regional Water Quality Control Board, Colorado River Basin Region; and

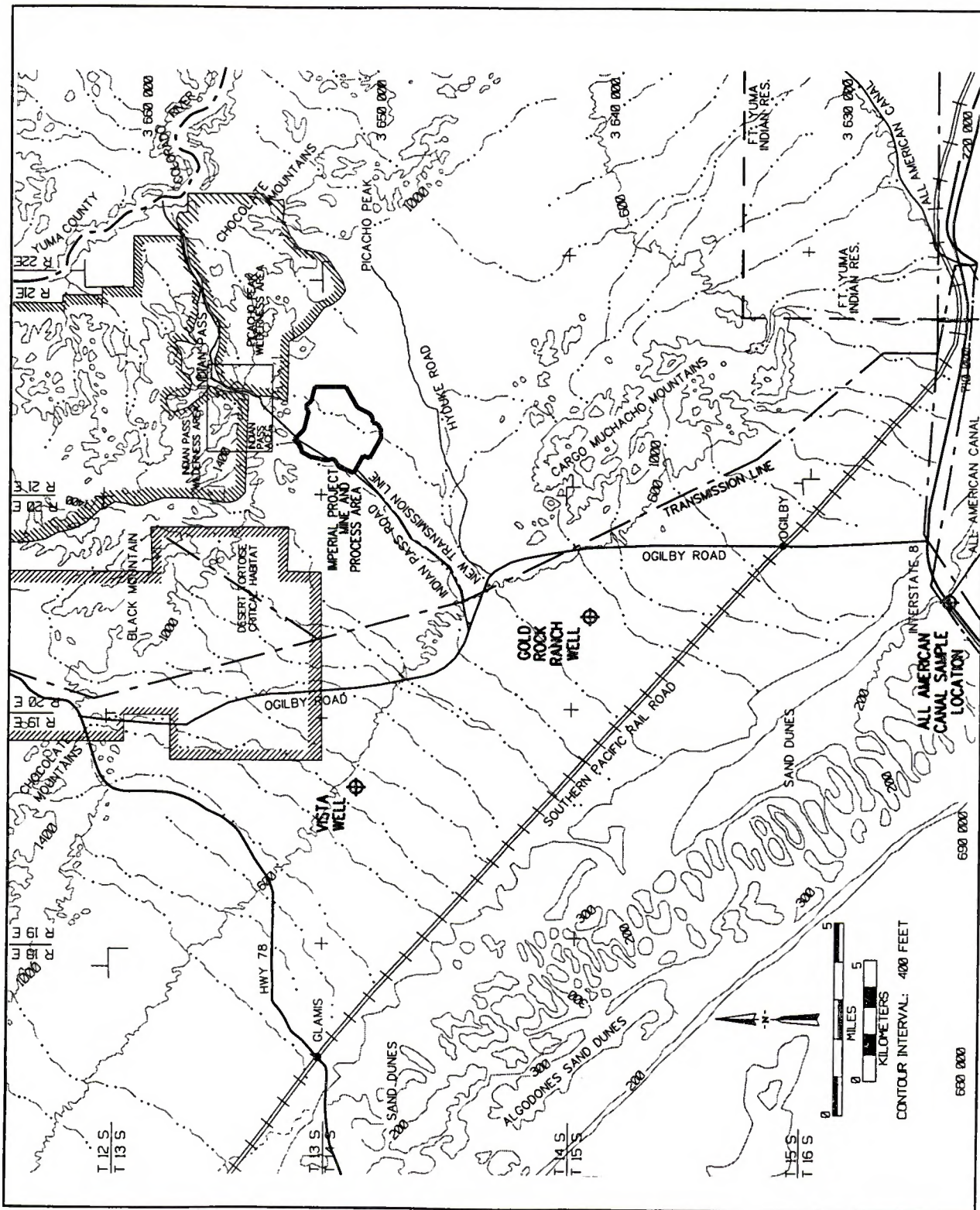


Figure 1: Imperial Project Vicinity Map

- A discussion of the recommended maximum pumping rate for water supply well PW-1 and the additional ground water production wells.

2. CHEMGOLD PROJECT GROUND WATER SAMPLING AND ANALYSES AVAILABLE SINCE THE WESTEC REPORT

Table 2 summarizes the analyses of ground water samples collected by Chemgold from the two (2) Project monitoring wells, MW-1 and MW-2, and Table 3 summarizes the analyses of ground water samples collected by Chemgold from the two (2) Project holes, EC-5 and WC-5, subsequent to the samples reported in the WESTEC Report. Laboratory data sheets are included in Appendix A. As indicated in Table 2 and Table 3, each of these samples were collected unfiltered and placed in laboratory-prepared sample collection bottles containing preservatives appropriate to the analyses.

3. EMA GROUND WATER SAMPLING OF AUGUST 1996

3.1. Introduction

Environmental Management Associates, Inc. (EMA) was retained to undertake sampling and analyses of the existing Project ground water monitoring wells and specified coreholes completed in the water table located within the Project mine and process area, and to undertake sampling and analyses of both the Gold Rock Ranch well and the IID's All American Canal. This section of this report documents this sampling and analysis.

3.2. Field Methodology and Observations

EMA staff supervised the sampling of the wells, coreholes and surface water source from August 28 through 30, 1996. Ground water samples were extracted from monitoring wells MW-1 and MW-2, and coreholes EC-5 and WC-5, located within the Project mine and process area, and from the water well located at Gold Rock Ranch, a small campground facility with a general store located approximately seven (7) miles southwest of the Project mine and process area. An additional sample was collected from the IID's All American Canal at the point west of the junction of Ogilby Road and Interstate 8 where Interstate 8 crosses the All American Canal. The locations of the Project wells and coreholes sampled are shown in Figure 2. The locations of the Gold Rock Ranch well and All American Canal sampling point are shown in Figure 1.

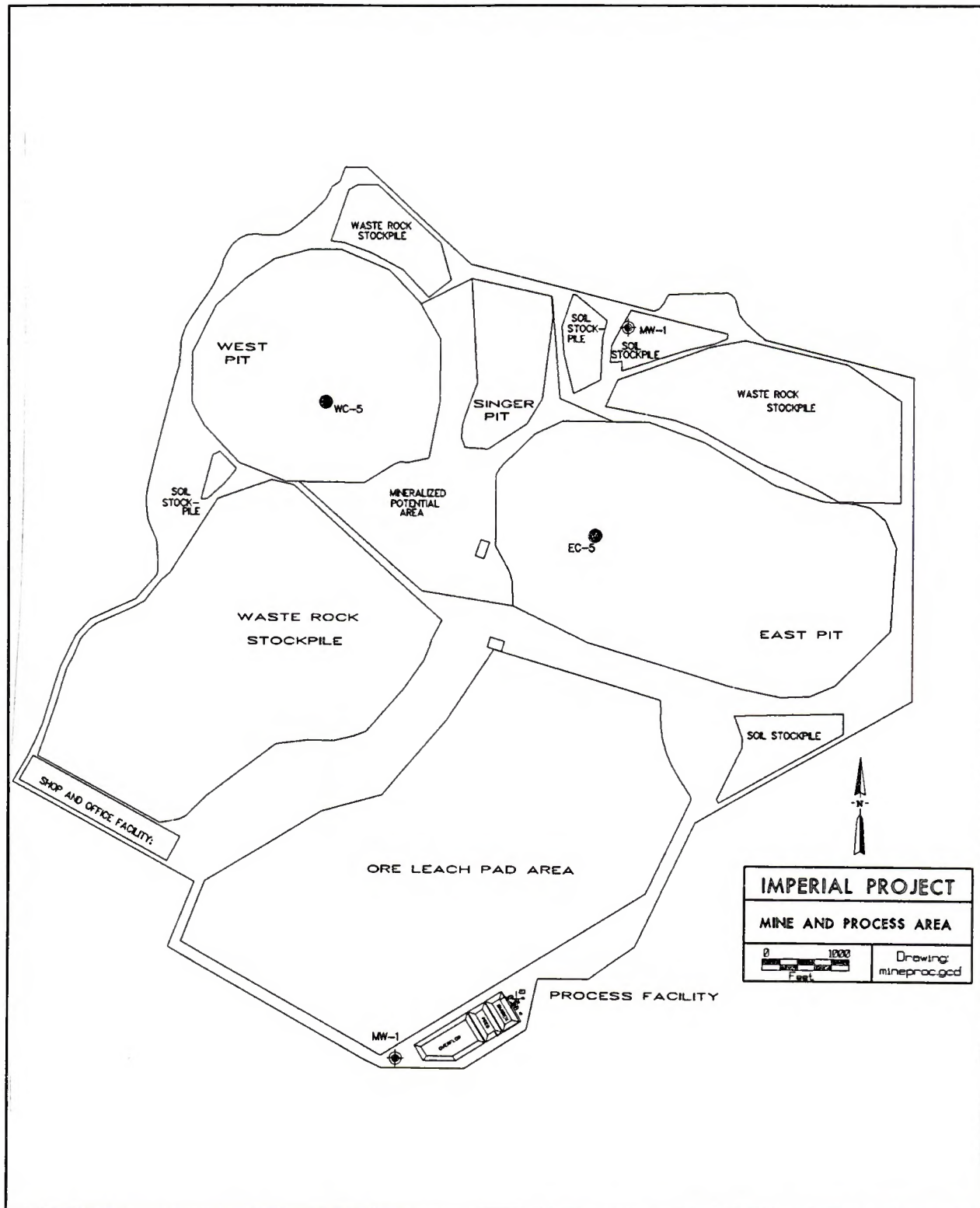


Figure 2: Location Map of Imperial Project Area Ground Water Coreholes and Wells



Prior to obtaining ground water samples from the onsite wells and coreholes, an attempt was made to purge at least three (3) casing volumes of water from each well or corehole through bailing in order to obtain samples as representative as possible of the ground water in the aquifer. Bailing was accomplished with the use of a truck-mounted winch using stainless-steel wire and either a 0.75-inch PVC or 1.0-inch or 1.5-inch stainless steel bailer (supplied by Chemgold). Conductivity, pH and temperature of the purged water from each well and corehole was field tested at least three (3) times per well or corehole prior to sampling. Purge water was disposed of on the ground.

The bailed ground water from WC-5, MW-1 and MW-2 appeared cloudy and contained a large amount of sediment, although both turbidity and sediment appeared to be decreasing with time. The bailed water from EC-5 was substantially less turbid and contained less sediment than the water bailed from the other wells and corehole, although it contained a substantial quantity of what appeared to be drilling fluid additives used during the drilling process. As the bailing progressed, field-tested conductivity, pH and temperature stabilized in the bailed water from each well or corehole. Due to time limitations, the reductions in turbidity and sediment, and the stabilization of field-tested conductivity, pH and temperature, purging was terminated after approximately 10 hours bailing each corehole (WC-5 and EC-5), and after approximately 4 hours bailing each well (MW-1 and MW-2), which resulted in the purging of the casing volumes indicated in Table 1.

Table 1: Well Sample Purge Volumes

Well Number/ Sample Location	Total Depth (ft bgs)	Depth to Water (ft bgs)	Casing Inside Diameter (inches)	Casing Volume (gal)	Casing Volumes Removed	Samples Collected ⁽¹⁾
WC-5	800	609.42	1.20	13	1.1	WC-5A/WC-5B
EC-5	800	722.22	1.20	5.4	2.4	EC-5A/EC-5B
MW-1	640	484.82	1.20	10	1.5	MW-1A/MW-1B
MW-2	880	626.18	1.75	26	1	MW-2A/MW-2B
Gold Rock Ranch	521	397	n/a	n/a	n/a	Gold Rock
All American Canal	n/a	n/a	n/a	n/a	n/a	A A Canal

(1)"A" samples filtered, "B" samples unfiltered. Both Gold Rock Ranch and AA Canal samples filtered
n/a not applicable or unknown

The Gold Rock Ranch ground water well supplies domestic water for the Ranch, and runs intermittently each day. Because the well is used each day, the well was purged by pumping for approximately 5 minutes before sampling.

Samples of the ground water from the Project wells and coreholes were obtained using the PVC or stainless steel bailer suspended on a stainless steel wire. The bailed water to be sampled was first placed in another filtering bailer which had been washed (see below). Except as noted below, one (1) set of samples from each well and corehole, designated the "A" samples, were field-filtered with a 0.45 μm filter into the laboratory-prepared sample bottles which contained preservatives appropriate for the analysis. Because of the quantity of sediment in the samples, several filters were required for filtration of each sample. A second set of samples from each of the wells and coreholes, designated the "B" samples, were collected unfiltered in the laboratory-prepared sample bottles to duplicate the sample collection conditions which were used by Chemgold for its previous samples of ground waters from these wells and coreholes.

The unpreserved sample of WC-5A was not filtered in the field but filtered instead by the laboratory. All of the EC-5A samples were also not preserved nor filtered in the field, but were filtered by the laboratory. All of the collected samples were stored either in a refrigerator or on blue ice during collection, and were stored on blue ice during shipping. Chain-of-custody records were completed for the samples, and the samples were delivered to *Core Laboratories* on September 4, 1996.

All bailing and sampling equipment was cleaned with Liquinox and tap water, rinsed with tap water, and rinsed again with distilled water between wells and prior to each bailing and sampling activity.

Samples of the Gold Rock Ranch ground water well were collected from the tap immediately downstream of the well head and upstream of the storage tank. Samples were collected in a clean, unpreserved sample container, then field-filtered with a 0.45 μm filter into the laboratory-prepared sample bottles which contained preservatives appropriate for the analysis. Samples of the All American Canal were collected with a clean, unpreserved sample container, then field-filtered with a 0.45 μm filter into the laboratory-prepared sample bottles which contained preservatives appropriate for the analysis.

Core Laboratories was given instructions to analyze ground water samples from wells MW-1, MW-2, coreholes EC-5 and WC-5, and samples from the Gold Rock Ranch ground water well and the All American Canal for selected for Profile II analysis.

3.3. Results of Laboratory Analysis

Table 2 presents the analyses of both the filtered and unfiltered samples from the Project monitoring wells, and Table 3 presents the analyses of the filtered and unfiltered samples from the Project coreholes and the analyses of the samples collected from the Gold Rock Ranch well and the All American Canal. Laboratory data sheets are included as Appendix B.

3.4. Results and Discussion

The filtered samples from the Project wells and coreholes were collected to accurately establish the existing ground water chemistry of the Project mine and process area, while the unfiltered samples were collected for comparison to earlier unfiltered samples of the same Project wells and coreholes. The analyses presented in Table 2 and Table 3 indicate that all of the filtered samples from all of the Project wells and coreholes met all of the applicable California primary maximum contaminant levels (MCLs) for drinking water, and met all of the applicable secondary MCLs except as follows:

- All filtered samples exceeded the California secondary MCL for manganese and TDS;
- Monitoring well MW-2 exceeded the secondary MCLs for chloride and sulfate; and
- Corehole WC-5 exceeded the secondary MCLs for sulfate and iron.

All of the analyses from the filtered samples from the Project wells and coreholes also fell within the range of analyses from regional wells, as reported in the WESTEC Report.

Table 3 also shows the sample results from the Gold Rock Ranch well, which exceeded the secondary MCLs for chloride and TDS. These analyses are similar to the regional ground water quality reported in Table 7.1 of the WESTEC Report, which shows that the Vista, Gold Rock Ranch, Singer, and GF wells each exceed the secondary MCLs for chloride, sulfate and TDS. Table 3 also shows that the sample of water from the All American Canal exceeded the secondary MCLs for sulfate and TDS.

Table 2: Water Quality Data from Project Monitoring and Production Wells

Element	Units	Current Drinking Water Quality	Well Number							
			MW-1	MW-1	MW-1 A	MW-1 B	MW-2	MW-2	MW-2 A	MW-2 B
Collection Date		Standards	04/22/96	08/15/96	08/29/96	08/29/96	07/11/96	08/15/96	08/29/96	08/29/96
Field Filtering			unfiltered	unfiltered	filtered	unfiltered	unfiltered	unfiltered	filtered	unfiltered
Alkalinity	mg/l		183	171	163	186	246	169	95	195
Aluminum	mg/l	1.0 (1)/0.02 (2)	<0.1	0.3	<0.02	1.37	0.7	1.3	<0.02	4.03
Antimony	mg/l	0.006 (1)	<0.04	<0.003	<0.005	<0.005	<0.003	<0.003	<0.005	<0.005
Arsenic	mg/l	0.05 (1)	0.02	<0.005	<0.01	0.01	<0.005	<0.005	0.09	0.11
Barium	mg/l	1.0 (1)	0.2	<0.1	0.17	0.21	0.1	0.1	0.04	0.08
Beryllium	mg/l	0.004 (1)	<0.002	<0.002	<0.001	0.001	<0.002	<0.002	<0.001	0.002
Bismuth	mg/l		<0.1	<0.1	<1	<1	<0.1	<0.1	<1	<1
Boron	mg/l				0.50	0.53			4.95	5.06
Cadmium	mg/l	0.005 (1)	<0.0002	<0.002	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005
Calcium	mg/l		53	34	49.4	57.1	64	80	67.3	108
Chloride	mg/l	250 (2)	91	39	56.1	61.1	130	120	641	606
Chromium	mg/l	0.05 (1)	<0.1	<0.1	<0.01	0.03	<0.1	<0.1	<0.01	0.07
Cobalt	mg/l		<0.1	<0.1	<0.03	<0.03	<0.1	<0.1	<0.03	<0.03
Conductance	µmhos/cm				832	832			2460	2460
Copper	mg/l	1.0 (2)	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	0.03
Fluoride	mg/l	1.4 (1)	0.2	0.3	0.6	0.6	0.2	0.2	0.6	0.6
Gallium	mg/l		<0.1	<0.1	<0.5	<0.5	<0.1	<0.1	<0.5	<0.5
Iron	mg/l	0.3 (2)	<0.1	0.2	<0.03	4.39	0.5	1.7	<0.03	6.64
Lead	mg/l		<0.002	<0.005	<0.003	0.049	<0.003	<0.005	<0.003	0.024
Lithium	mg/l		<0.1	<0.1	0.04	0.06	<0.1	<0.1	0.58	0.67
Magnesium	mg/l		6.7	3.4	5.3	5.7	28	31	19.0	27.5
Manganese	mg/l	0.05 (2)	0.1	<0.1	0.70	1.10	<0.1	0.20	0.09	0.50
Mercury	mg/l	0.002 (1)	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0002
Molybdenum	mg/l		<0.1	<0.1	<0.05	<0.05	<0.1	<0.1	0.12	0.06
Nickel	mg/l	0.1 (1)	<0.1	<0.1	<0.04	0.04	<0.1	<0.1	<0.04	0.08
Nitrate Nitrogen	mg/l	10 (1)	<0.1	<0.1	0.13	0.05	0.2	0.3	0.07	<0.05
pH	mg/l	6.8 - 8.5	7.47	7.29	7.69	7.51	7.79	7.49	7.70	7.64
Phosphorous	mg/l		<0.1	<0.1	0.09	0.31	<0.1	<0.1	0.03	0.80
Potassium	mg/l		4.7	4.1	6	10	8.6	5.9	10	20
Scandium	mg/l		<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01
Selenium	mg/l	0.05 (1)	<0.001	<0.001	<0.01	<0.01	<0.001	0.001	<0.01	<0.01
Silver	mg/l	0.1 (2)	<0.0005	<0.002	<0.01	<0.01	<0.002	<0.002	<0.01	<0.01
Sodium	mg/l		160	150	159	135	140	150	537	463
Strontium	mg/l		4.5	0.3	4.28	4.19	1.3	1.3	2.57	2.61
Sulfate	mg/l	250 (2)	210	160	230	211	320	270	360	230
TDS	mg/l	500 (2)	656	529	620	640	728	804	1780	1690
Thallium	mg/l	0.002 (1)	<0.0005	<0.001	<0.002	<0.005	<0.001	<0.001	<0.002	<0.005
Tin	mg/l		<1	<0.5	<0.05	<0.05	<1	<0.5	<0.05	<0.05
Titanium	mg/l		<0.1	<0.1	<0.01	<0.01	<0.1	0.1	<0.01	0.01
Vanadium	mg/l		<0.1	<0.1	<0.05	<0.05	<0.1	<0.1	<0.05	<0.05
Zinc	mg/l	5.0 (2)	<0.1	<0.1	<0.01	0.06	<0.1	0.1	<0.01	0.26

(1) California Primary Maximum Contaminant Limit (2) California Secondary Maximum Contaminant Limit

Imperial Project
Supplemental Hydrology Study
September 1996

Table 3: Water Quality Analysis

Element	Units	Current Water Quality Standards	EC-5 A	EC-5 B	WC-5 A	WC-5 B	Gold Rock	AA Canal	Trip Blank
			8/30/96	8/30/96	8/28/96	8/28/96	8/30/96	8/30/96	8/27/96
Filed Filtering			filtered	unfiltered	filtered	unfiltered	filtered	filtered	
Alkalinity	mg/l		400	910	201	202	75	154	<5
Aluminum	mg/l	0.02 (2)	<0.02	0.54	<0.02	0.32	<0.02	<0.02	<0.02
Antimony	mg/l	0.006 (1)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic	mg/l	0.05 (1)	<0.01	0.03	<0.01	<0.01	0.01	<0.01	<0.01
Barium	mg/l	1.0 (1)	<0.01	0.07	0.03	0.07	0.06	0.12	<0.0
Beryllium	mg/l	0.004 (1)	0.002	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	mg/l		<1	<1	<1	<1	<1	<1	<1
Boron	mg/l		0.12	0.24	0.74	3.29	0.90	0.16	<0.05
Cadmium	mg/l	0.005 (1)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium	mg/l		32.3	221	59.4	85.1	31.0	86.4	<0.1
Chloride	mg/l	250 (2)	204	1450	162	144	351	119	<0.5
Chromium	mg/l	0.05 (1)	<0.01	0.11	<0.01	0.08	<0.01	<0.01	<0.01
Cobalt	mg/l		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Field Conductance	µmhos/cm		1683	1683	1290	1290	880	1920	n/a
Copper	mg/l	1.0 (2)	<0.01	0.07	<0.01	0.02	<0.01	<0.01	<0.01
Fluoride	mg/l		0.8	0.8	0.8	0.8	3.0	0.6	<0.1
Gallium	mg/l		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron	mg/l	0.3 (2)	0.11	2.36	0.60	2.66	<0.03	<0.03	<0.03
Lead	mg/l		<0.003	0.008	<0.003	0.014	<0.003	<0.003	<0.003
Lithium	mg/l		0.08	0.20	0.07	0.08	0.09	0.06	<0.01
Magnesium	mg/l		5.3	37.7	16.1	27.4	0.6	32.8	<0.1
Manganese	mg/l	0.05 (2)	2.01	20.1	0.47	0.35	<0.01	<0.01	<0.01
Mercury	mg/l	0.002 (1)	0.0005	0.0027	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/l		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	mg/l	0.1 (1)	<0.04	0.10	<0.04	0.14	<0.04	<0.04	<0.04
Nitrate Nitrogen	mg/l	10 (1)	0.44	<0.05	0.06	0.11	1.52	0.35	<0.05
pH	mg/l	6.8 - 8.5	8.48	7.43	7.61	7.59	7.74	8.10	12.84
Phosphorous	mg/l		0.66	0.07	0.03	0.13	0.02	<0.01	<0.01
Potassium	mg/l		26	18	12	10	6	6	<5
Scandium	mg/l		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	mg/l	0.05 (1)	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Silver	mg/l	0.1 (2)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	mg/l		194	349	233	176	300	137	<1
Strontium	mg/l		0.67	5.46	1.30	1.35	1.01	1.23	<0.01
Sulfate	mg/l	250 (2)	140	130	310	324	130	309	<10
TDS	mg/l	500 (2)	4440	6010	1160	1060	920	820	20
Thallium	mg/l	0.002 (1)	<0.002	<0.005	<0.002	<0.005	<0.002	<0.002	<0.002
Tin	mg/l		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	mg/l		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	mg/l		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc	mg/l	5.0 (2)	<0.01	0.12	<0.01	0.14	0.02	0.01	<0.01

(1) California Primary Maximum Contaminant Limit (2) California Secondary Maximum Contaminant Limit

Piper and Stiff diagrams were constructed for the filtered samples from Project monitoring wells MW-1 and MW-2, for the filtered samples from coreholes EC-5 and WC-5, for the current Gold Rock Ranch and All American Canal samples, and for the data presented in the WESTEC Report for the Vista well and the Project ground water production well PW-1 (insufficient information was available in the WESTEC Report to prepare diagrams for the other reported wells) (see Figure 3). The Stiff diagrams indicate that the dominant cation species are sodium and potassium for all samples, while the dominant anion varies from sulfate and carbonate/bicarbonate near the Project mine and process area to chloride and sulfate in the alluvial basin. The Piper diagrams also show that the dominant cations for all the water samples are sodium and potassium. The Piper diagrams also show that near the Project mine and process area there is no clearly dominant anion, but shows that the dominant anion is chloride in the alluvial aquifer downgradient from the Project mine and process area.

Comparisons of the analyses of the current filtered and unfiltered samples indicate that the concentrations of some metals in the filtered samples were substantially lower than the concentrations of the same metals in the unfiltered samples. While iron and aluminum concentrations in both monitoring wells were below detection levels in the filtered samples, the unfiltered samples had substantial concentrations of both. Manganese concentrations were substantially lower in the filtered samples than the unfiltered samples, and the concentrations from the unfiltered samples correlate well with the regional manganese concentrations reported in the WESTEC Report. TDS, sulfate and chloride concentrations appear to be unaffected by the field-filtering prior to preservation. A comparison of the analyses of the late-August unfiltered samples and all of the other unfiltered samples from the same hole or well did not indicate any significant chemical species variations.

4. ADDITIONAL MONITORING WELL AND COREHOLE INFORMATION

The following presents a discussion of the construction methods used for monitoring well MW-2, as obtained from Chemgold, and a brief elaboration of the aquifer testing conducted by WESTEC, as obtained from WESTEC.

Monitoring Well MW-2 was drilled and installed in June 1996. As shown in Figure 4, the well was constructed with 2-inch diameter schedule 80 PVC to a total depth of 800 feet bgs. Forty feet of 0.040 inch screen was installed at the base of the well with 760 feet of blank casing extending to the surface. A pack of clean pea gravel was installed in the annular space to cover the screen and a bentonite seal was placed over the gravel pack. Three-quarter (3/4)-inch washed gravel extends from the bentonite seal to within 50 feet of the surface, and a cement seal was placed from the 50-foot depth to the surface.

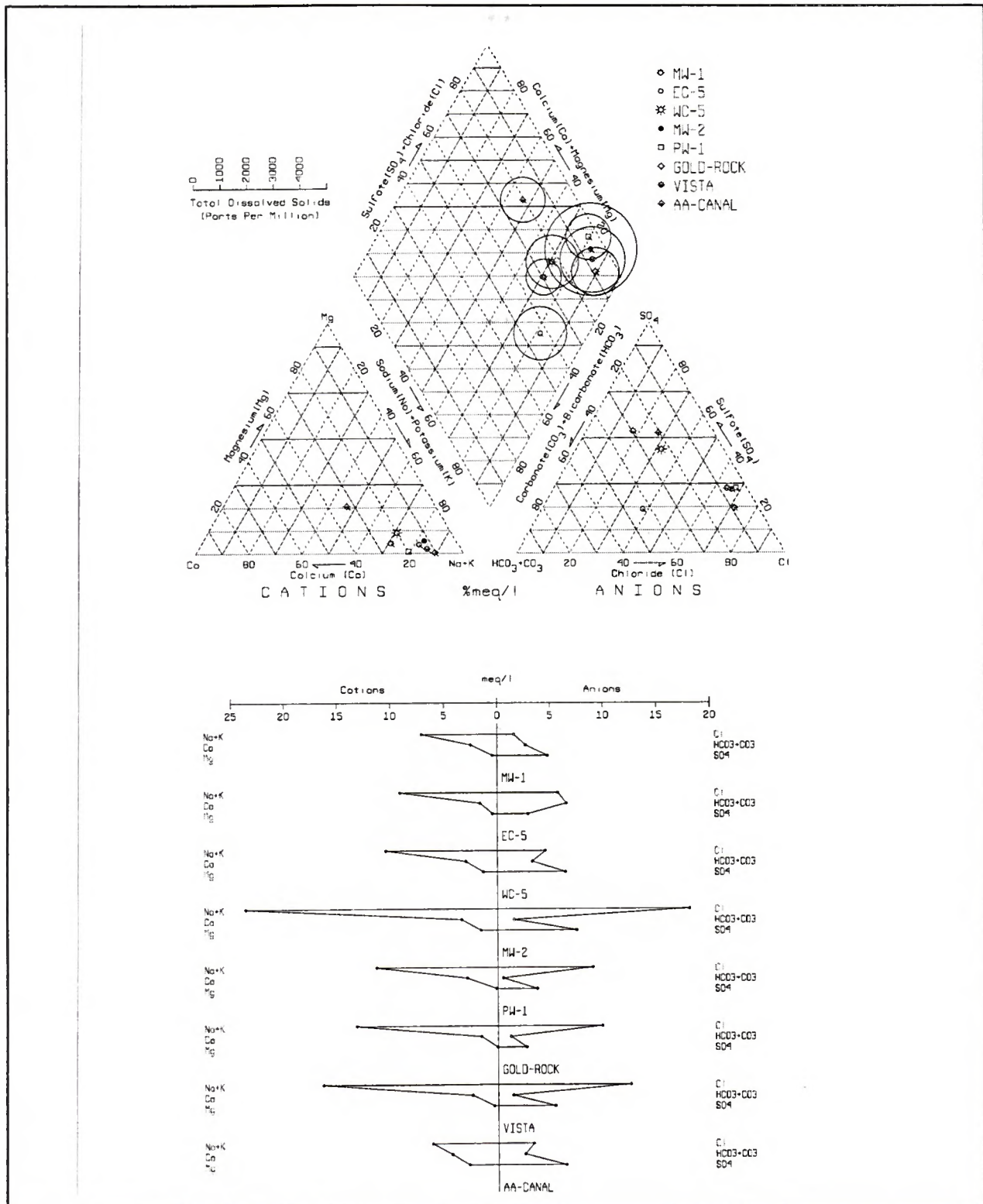


Figure 3: Piper and Stiff Diagrams

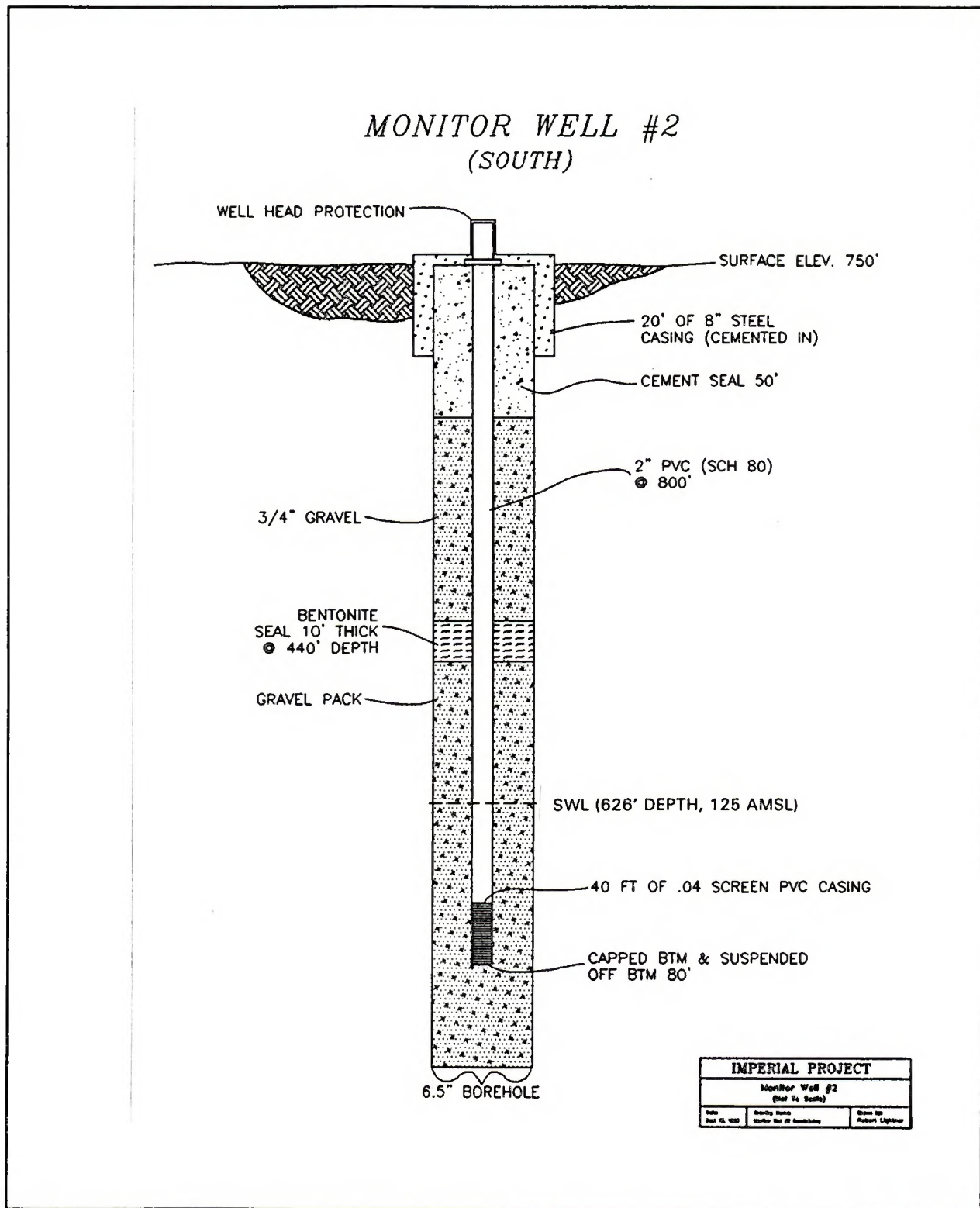


Figure 4: Monitoring Well MW-2 Construction Diagram

Aquifer testing was performed by WESTEC only on a limited number of wells and holes. A pumping test was performed only on production well PW-1 because the casings in the holes were too small, and the water levels too deep, to allow a sufficient volume of water to be pumped from the holes to conduct a meaningful test. Falling head tests were performed on coreholes EC-5, WC-5, H-4 and H-5, but because of the long (40-foot) screened interval and high aquifer permeability in both H-4 and H-5, these holes could not be filled with enough water to accurately measure the falling head. However, WESTEC was able to conduct slug tests on all four (4) of these Project holes.

Table 4 lists each of the wells installed, or coreholes completed to sample ground water, for the Project, and indicates the proposed use, location, total depth, depth to static water level, and the aquifer each well or corehole is completed in.

Table 4: Summary of Physical Data From Selected Piezometer Holes, Monitoring Wells, and Production Wells

Put in EIS

Hole Number	Location	Total Depth	Depth to Static Water	Aquifer
		(ft bgs)		
Piezometer Holes				
94H-1	Mine and Process Area	1,000	657.2	Alluvial (unconfined)
EC-5	Mine and Process Area	800	720	Bedrock
WC-5	Mine and Process Area	800	606	Bedrock
WR-2	Mine and Process Area	945	694.5	Alluvial (unconfined)
H-4	Mine and Process Area	1,000	544.6	Alluvial (confined)
H-5	Mine and Process Area	1,080	594.5	Bedrock
H-6	Mine and Process Area	920	631.5	Alluvial (confined)
Monitoring Wells				
MW-1	Mine and Process Area	640	479.7	Conglomerate (confined)
MW-2	Mine and Process Area	880	657.2	Bedrock
Production Wells				
PW-1	Water Supply Area	960	544.4	Alluvial (confined)

5. MONITORING PLAN

The California Regional Water Control Board, Colorado River Basin Region (CRWQCB) requires that each applicant for Waste Discharge Requirements (which authorizes the discharge of wastes to land) prepare and submit a monitoring plan, which must be approved by the CRWQCB prior to the commencement of discharges. Typically required by the CRWQCB in the monitoring plan is the installation and regular monitoring of a vadose (unsaturated) zone monitoring system, which would be installed to detect potential leaks of liquid waste or leachate into the vadose zone prior to any discharge into the underlying ground water, and wells completed in the uppermost aquifer both upgradient and downgradient of the waste management unit (WMU) to monitor the ground water in this aquifer prior to, during, and following the authorized discharge of waste to land. Both the vadose zone monitoring system and the ground water monitoring wells would be required to be sampled regularly for "constituents of concern," which would be identified, based upon the nature of the waste to be discharged and the constituents in the ground water, prior to discharge. Consistent sampling, analyses and reporting would be required by the CRWQCB, such that any significant changes in the monitoring results may indicate the introduction of constituents into the ground water from the waste.

6. PUMPING RATE OF PW-1

WESTEC recommended a average maximum pumping rate of 550 gpm for production well PW-1. This pumping rate was based on individual well specifics determined during the aquifer pumping test conducted by WESTEC. A average maximum pumping rate of 550 gpm from production well PW-1 was estimated as a safe withdrawal rate which would prevent possible damage to the well or pumping system due to excessive drawdown in the well. If the efficiency of the well can be increased by subsequent additional well development, the pumping rate of well PW-1 may be safely increased to that rate determined appropriate by the well production engineer. If and/or when additional production wells are installed for the Project, an average maximum pumping rate should be established by the well production engineer for each well which prevents excessive drawdown or possible damage to the specific well or pumping system.

APPENDIX A
ANALYTICAL RESULTS OF PREVIOUS SAMPLES

Laboratory Analysis Report



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CHENGOLD, INC.

CHENGOLD, INC.
DAN PURVANCE
1891 RAIL AVENUE
YUMA AZ 85365

Date : 8/02/96
Client : CMG-001
Taken by: CLIENT-D. PURVANCE
Report : 16843
PO# : 1024

Page: 1

Sample	Collected Date Time	ALKALINITY MG/L CaCO3	ALKALINITY TOTAL MG/L CaCO3	PH S.U.	TOTAL DISSOL. SOLIDS MG/L	NITRATE-N MG/L	CALCIUM ICP MG/L
MONITOR WELL #2	7/11/96 10:30	2468*	2468*	7.79	728	0.2N	64
Sample	Collected Date Time	MAGNESIUM ICP MG/L	POTASSIUM ICP MG/L	SELENIUM AA HYDRIDE MG/L	SODIUM ICP MG/L	LEAD AA FURNACE MG/L	SILVER AA FURNACE MG/L
MONITOR WELL #2	7/11/96 10:30	28	8.6	<0.001	140	<0.003	<0.002
Sample	Collected Date Time	CHLORIDE MG/L	WAD CYANIDE MG/L	FLUORIDE MG/L	SULFATE MG/L	ANTIMONY AA FURNACE MG/L	ALUMINUM, ICP-SQ MG/L
MONITOR WELL #2	7/11/96 10:30	130	<0.005	0.2	320	<0.003	0.7
Sample	Collected Date Time	BARIUM, ICP-SQ MG/L	BISMUTH, ICP-SQ MG/L	CHROMIUM, ICP-SQ MG/L	COBALT, ICP-SQ MG/L	COPPER, ICP-SQ MG/L	GALLIUM, ICP-SQ MG/L
MONITOR WELL #2	7/11/96 10:30	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sample	Collected Date Time	IRON, ICP-SQ MG/L	LANTHANUM, ICP-SQ MG/L	LITHIUM, ICP-SQ MG/L	MANGANESE, ICP-SQ MG/L	MOLYBDENUM ICP-SQ MG/L	NICKEL, ICP-SQ MG/L
MONITOR WELL #2	7/11/96 10:30	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sample	Collected Date Time	PHOSPHORUS, ICP-SQ MG/L	SCANDIUM, ICP-SQ MG/L	STRONTIUM, ICP-SQ MG/L	TIN, ICP-SQ MG/L	TITANIUM, ICP-SQ MG/L	VANADIUM, ICP-SQ MG/L
MONITOR WELL #2	7/11/96 10:30	< 0.1	< 0.1	1.3	< 1	< 0.1	< 0.1

Approved By:

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.

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John C. Seher
Manager

Laboratory Analysis Report



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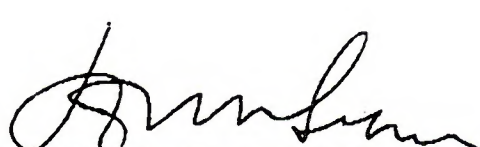
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CHEMGOLD, INC.
DAN PURVANCE
1891 RAIL AVENUE
YUMA AZ 85365

Date : 8/02/96
Client : CMC-001
Taken by: CLIENT-D. PURVANCE
Report : 16843
PO# : 1024

Page: 2

Sample	Collected Date Time	ZINC, TCP-SQ MG/L	ARSENIC AA HYDRIDE MG/L	BERYLLIUM AA FURNACE MG/L	CADMIUM AA FURNACE MG/L	MERCURY AA COLD VAPOR MG/L	THALLIUM AA FURNACE
MONITOR WELL #2	7/11/96 10:30	< 0.1	<0.005	<0.002	<0.002	<0.0005	<0.001

Approved By: 
This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.

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Manager

**Laboratory
Analysis Report**



NOTED/VERIFIED

AUG - 5 1996

**Sierra
Environmental
Monitoring, Inc.**

CHENGOLD, INC.

**CHEMGOLD, INC.
DAN PURVANCE
1891 RAIL AVENUE
YUMA AZ 85365**

**Date :
Client : CHG-001
Taken by: CLIENT-D. PURVANCE
Report : 16843
Pof : 1024**

Page: 3

*** ALKALINITY VALUE IS BIASED HIGH DUE TO LARGE AMOUNT OF SUSPENDED MATTER
IN THE SAMPLE.**

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.

**William F. Pillsbury
President**

**1135 Financial Blvd.
Reno, NV 89502
Phone (702) 857-2400
FAX (702) 857-2404**

**John C. Seher
Manager**

Laboratory Analysis Report



**Sierra
Environmental
Monitoring, Inc.**

**CHENGOLD, INC.
DAN PURVANCE
1891 RAIL AVENUE
YUMA AZ 85365**

**Date : 9/27/95
Client : CMG-001
Taken by: CLIENT-D. PURVANCE
Report : 14191
PO# : 1024**

Page: 1

Sample	Collected Date Time	ALKALINITY MG/L CaCO3	ALKALINITY TOTAL MG/L CaCO3	PH S.U.	TOTAL DISSOL. SOLIDS MG/L	NITRATE-N MG/L	ARSENIC AA HYDRIDE MG/L
CHENGOLD MW #1	8/30/95 9:00	1388	138	7.99	799	0.1N	<0.005
Sample	Collected Date Time	CALCIUM MG/L	MAGNESIUM ICP MG/L	MERCURY AA COLD VAPOR MG/L	POTASSIUM ICP MG/L	SELENIUM AA HYDRIDE MG/L	SODIUM ICP MG/L
CHENGOLD MW #1	8/30/95 9:00	83	31	<0.0005	6.0	<0.001	130
Sample	Collected Date Time	LEAD AA FURNACE MG/L	CADMIUM AA FURNACE MG/L	SILVER AA FURNACE MG/L	CHLORIDE MG/L	HAZ CYANIDE MG/L	FLUORIDE MG/L
CHENGOLD MW #1	8/30/95 9:00	0.009	0.0004	<0.0005	92	<0.005	0.2
Sample	Collected Date Time	SULFATE MG/L	ALUMINUM, ICP-SQ MG/L	ANTIMONY, ICP-SQ MG/L	BARIUM, ICP-SQ MG/L	BERYLLIUM, ICP-SQ MG/L	BISMUTH, ICP-SQ MG/L
CHENGOLD MW #1	8/30/95 9:00	290	0.5	<0.5	0.2	<0.1	<0.1
Sample	Collected Date Time	CHROMIUM, ICP-SQ MG/L	COBALT, ICP-SQ MG/L	COPPER, ICP-SQ MG/L	GALLIUM, ICP-SQ MG/L	IRON, ICP-SQ MG/L	LANTHANUM, ICP-SQ MG/L
CHENGOLD MW #1	8/30/95 9:00	<0.1	<0.1	<0.1	<0.1	1.4	<0.1
Sample	Collected Date Time	LITHIUM, ICP-SQ MG/L	MANGANESE, ICP-SQ MG/L	MOLYBDENUM ICP-SQ MG/L	NICKEL, ICP-SQ MG/L	PHOSPHORUS, ICP-SQ MG/L	SCANDIUM, ICP-SQ MG/L
CHENGOLD MW #1	8/30/95 9:00	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1

Approved By:

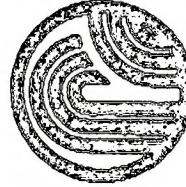
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President

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FAX (702) 857-2404

John C. Seher
Manager

**Laboratory
Analysis Report**



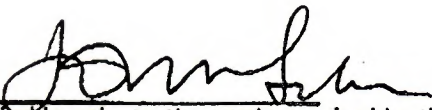
**Sierra
Environmental
Monitoring, Inc.**

**CHEMGOLD, INC.
DAN PURVANCE
1891 RAIL AVENUE
YUMA AZ 85365**

**Date : 9/27/95
Client : CMG-001
Taken by: CLIENT-D. PURVANCE
Report : 14191
PO# : 1024**

Page: 2

Sample	Collected		STRONTIUM, ICP-SQ	THALLIUM, ICP-SQ	TIN, ICP-SQ	TITANIUM, ICP-SQ	VANADIUM, ICP-SQ	ZINC, ICP-SQ
	Date	Time	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
CHEMGOLD MW #1	8/30/95	9:00	1.8	<1	<1	<0.1	<0.1	0.3

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**John C. Seher
Manager**

Laboratory Analysis Report



MAY 28 1996

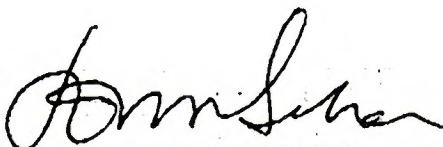
Sierra Environmental Monitoring, Inc.

CHENGOLD, INC.
DAN PURVANCE
1891 RAIL AVENUE
YUMA AZ 85365

Date : 5/24/96
Client : CMG-001
Taken by: CLIENT-D. PURVANCE
Report : 16119
PO# : 01024

Page: 1

Sample	Collected Date Time	ALKALINITY MG/L CAC03	ALKALINITY TOTAL MG/L CAC03	PH S.U.	TOTAL DISSOL. SOLIDS MG/L	NITRATE-N MG/L	ARSENIC AA HYDRIDE MG/L
MONITOR WELL #1	4/22/96 12:30	1838	183	7.47	654	<0.1N	0.020
Sample	Collected Date Time	CALCIUM ICP MG/L	MAGNESIUM ICP MG/L	MERCURY AA COLD VAPOR MG/L	POTASSIUM ICP MG/L	SELENIUM AA HYDRIDE MG/L	SODIUM ICP MG/L
MONITOR WELL #1	4/22/96 12:30	53	6.7	<0.0005	4.7	<0.001	160
Sample	Collected Date Time	LEAD AA FURNACE MG/L	CADMIUM AA FURNACE MG/L	SILVER AA FURNACE MG/L	CHLORIDE MG/L	WAD. CYANIDE MG/L	FLUORIDE MG/L
MONITOR WELL #1	4/22/96 12:30	<0.002	<0.0002	<0.0005	91	<0.005	0.2
Sample	Collected Date Time	SULFATE MG/L	ANTIMONY AA FURNACE MG/L	ALUMINUM, ICP-SQ MG/L	BARIUM, ICP-SQ MG/L	BISMUTH, ICP-SQ MG/L	CHROMIUM, ICP-SQ MG/L
MONITOR WELL #1	4/22/96 12:30	210	<0.040*	< 0.1	0.2	< 0.1	< 0.1
Sample	Collected Date Time	COBALT, ICP-SQ MG/L	COPPER, ICP-SQ MG/L	GALLIUM, ICP-SQ MG/L	IRON, ICP-SQ MG/L	LANTHANUM, ICP-SQ MG/L	LITHIUM, ICP-SQ MG/L
MONITOR WELL #1	4/22/96 12:30	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sample	Collected Date Time	MANGANESE, ICP-SQ MG/L	MOLYBDENUM ICP-SQ MG/L	NICKEL, ICP-SQ MG/L	PHOSPHORUS, ICP-SQ MG/L	SCANDIUM, ICP-SQ MG/L	STRONTIUM, ICP-SQ MG/L
MONITOR WELL #1	4/22/96 12:30	0.1	< 0.1	< 0.1	< 0.1	< 0.1	4.5

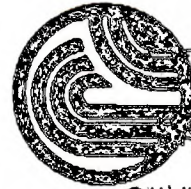
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William F. Pillsbury
President

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Reno, NV 89502
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John C. Seher
Manager

Laboratory
Analysis Report



MAY 28 1996

Sierra
Environmental
Monitoring, Inc.

CHENGOLD, INC.
DAN PURVANCE
1891 RAIL AVENUE
YUMA AZ 85365

Date : 5/24/96
Client : CMG-001
Taken by: CLIENT-D. PURVANCE
Report : 16119
PO# : 01024

Page: 2

Sample	Collected		TIN, ICP-SQ	TITANIUM, ICP-SQ	VANADIUM, ICP-SQ	ZINC, ICP-SQ	BERYLLIUM AA FURNACE	THALLIUM AA FURNACE
	Date	Time	MG/L	MG/L	MG/L	MG/L	MG/L	
MONITOR WELL #1	4/22/96	12:30	< 1	< 0.1	< 0.1	< 0.1	<0.002	<0.0005

A handwritten signature in dark ink, appearing to read "John C. Seher", is written over a horizontal line.

Approved By: _____
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Reno, NV 89502
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John C. Seher
Manager



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CHEMGOLD, INC.

Laboratory Analysis Report

Sierra
Environmental
Monitoring, Inc.

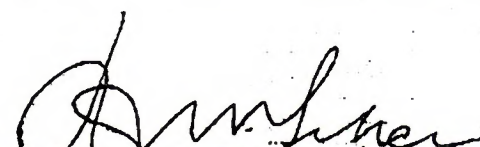
CHEMGOLD, INC.
DAN PURVANCE
1891 RAIL AVENUE
YUMA AZ 85365

Date : 9/11/96
Client : CMG-001
Taken by: CLIENT-D.P./R.A.F.
Report : 17182
PO# : 520-783-7891

Page: 1

Sample	Collected Date Time	ALKALINITY MG/L CaCO3	ALKALINITY TOTAL MG/L CaCO3	PH S.U.	TOTAL DISSOL. SOLIDS MG/L	NITRATE-N MG/L	CALCIUM ICP MG/L
MW #1	8/15/96 14:30	1718	171	7.29	529	<0.1M	34
MW #2	8/15/96 15:30	1698	169	7.49	804	0.3M	80
Sample	Collected Date Time	MAGNESIUM ICP MG/L	POTASSIUM ICP MG/L	SODIUM ICP MG/L	CHLORIDE MG/L	WAD CYANIDE MG/L	FLUORIDE MG/L
MW #1	8/15/96 14:30	3.4	4.1	150	39	<0.005	0.3
MW #2	8/15/96 15:30	31	5.9	150	120	<0.005	0.2
Sample	Collected Date Time	SULFATE MG/L	ALUMINUM, ICP-SQ MG/L	BARIUM, ICP-SQ MG/L	BISMUTH, ICP-SQ MG/L	CHROMIUM, ICP-SQ MG/L	COBALT, ICP-SQ MG/L
MW #1	8/15/96 14:30	160	0.3	< 0.1	< 0.1	< 0.1	< 0.1
MW #2	8/15/96 15:30	270	1.3	0.1	< 0.1	< 0.1	< 0.1
Sample	Collected Date Time	COPPER, ICP-SQ MG/L	GALLIUM, ICP-SQ MG/L	IRON, ICP-SQ MG/L	LANTHANUM, ICP-SQ MG/L	LITHIUM, ICP-SQ MG/L	MANGANESE, ICP-SQ MG/L
MW #1	8/15/96 14:30	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
MW #2	8/15/96 15:30	< 0.1	< 0.1	1.7	< 0.1	< 0.1	0.2
Sample	Collected Date Time	MOLYBDENUM ICP-SQ MG/L	NICKEL, ICP-SQ MG/L	PHOSPHORUS, ICP-SQ MG/L	SCANDIUM, ICP-SQ MG/L	STRONTIUM, ICP-SQ MG/L	TIN, ICP-SQ MG/L
MW #1	8/15/96 14:30	< 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.5
MW #2	8/15/96 15:30	< 0.1	< 0.1	< 0.1	< 0.1	1.3	< 0.5
Sample	Collected Date Time	TITANIUM, ICP-SQ MG/L	VANADIUM, ICP-SQ MG/L	ZINC, ICP-SQ MG/L	ANTIMONY AA FURNACE MG/L	ARSENIC AA HYDRIDE MG/L	BERYLLIUM AA FURNACE MG/L
MW #1	8/15/96 14:30	< 0.1	< 0.1	< 0.1	<0.003	<0.005	<0.002

Continued on Next Page

Approved by: 
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John C. Seher
Manager

Laboratory Analysis Report

CHEMGOLD, INC.
DAN PURVANCE
1891 RAIL AVENUE
YUMA AZ 85365



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SEP 13 1996

CHEMGOLD, INC.

Sierra
Environmental
Monitoring, Inc.

Date : 9/11/96
Client : CMG-001
Taken by: CLIENT-D.P./R.A.F.
Report : 17182
PO# : 520-783-7891

Page: 2

Sample	Collected Date Time	TITANIUM, ICP-SO MG/L	VANADIUM, ICP-SO MG/L	ZINC, ICP-SO MG/L	ANTIMONY AA FURNACE MG/L	ARSENIC AA HYDRIDE MG/L	BERYLLIUM AA FURNACE MG/L
MW #2	8/15/96 15:30	< 0.1	< 0.1	0.1	<0.003	<0.005	<0.002
Sample	Collected Date Time	CADMIUM AA FURNACE MG/L	LEAD AA FURNACE MG/L	MERCURY AA COLD VAPOR MG/L	SELENIUM AA HYDRIDE MG/L	SILVER AA FURNACE MG/L	THALLIUM AA FURNACE
MW #1	8/15/96 14:30	<0.002	<0.005	<0.0005	<0.001	<0.002	<0.001
MW #2	8/15/96 15:30	<0.002	<0.005	<0.0005	0.001	<0.002	<0.001

Approved By:

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President

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John C. Seher
Manager

APPENDIX B

ANALYTICAL RESULTS OF AUGUST 1996 SAMPLING



CORE LABORATORIES

ANALYTICAL REPORT

JOB NUMBER: 962419

Prepared For:

Environmental Management Assoc.
100 West Grove Street
Suite 100
Reno, NV 89509-4026

Attention: John Heggeness

Date: 09/25/96

Signature

Name: Patrick J. McEntee

Title: Laboratory Supervisor

Date

CORE LABORATORIES, INC.
10703 East Bethany Drive
Aurora, CO 80014

PHONE: (303) 751-1780
FAX: (303) 751-1784



ENVIRONMENTAL MANAGEMENT ASSOCIATES

100 West Grove Street • Suite 100 • Reno, Nevada 89509-4026 • (702) 828-3939 • FAX (702) 828-3940

CHAIN OF CUSTODY RECORD

PROJ. NO. 1093		PROJECT NAME CHEM GOLD - Imperial				NO. OF CON- TAINERS	Please Give Sample #s 2, 5, 6, 8, 9 and 10, 1 week turn-a-round										
SAMPLERS: (Signature) John C. Heggness							REMARKS ALL SAMPLES MARKED "A" and Gold Rock & AA CANAL are filtered ALL OTHER ARE UNFILTERED. (B*)										
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION												
1					Trip Blank	4											
2	8/28	16:30	✓		WC-5 A *	3											
3	8/29	10:00	✓		WC-5 B	3											
4	8/29	12:00	✓		MW-1 B	3											
5	8/29	12:30	✓		MW-1 A	3											
6	8/29	17:00	✓		MW-2 A	3											
7	8/29	17:00	✓		MW-2 B	3											
8	8/30	4:30	✓		Gold Rock	3											
9	8/30	10:00	✓		AA Canal	3											
10	8/30	13:00	✓		EC-5 A *	4											
11	8/30	13:00	✓		EC-5 B	3	✓										
						send Results to J. Heggness (702)-828-3939 E.M.A. 100 W. Grove St. #100 Reno, Nev. 89509 Fax - 828-3940											
						send Bill and Results To: Dan Purvance (520)-782-189 CHEMGOLD INC 1891 Rail Ave Yuma, AZ.											
Relinquished by: (Signature) John C. Heggness			Date / Time 8/30 15:00		Received by: (Signature) [Signature]			Relinquished by: (Signature)			Date / Time 1		Received by: (Signature)				
Relinquished by: (Signature) [Signature]			Date / Time 9/3/96 16:00		Received by: (Signature) [Signature]			Relinquished by: (Signature)			Date / Time		Received by: (Signature)				
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature) M. Westhead			Date / Time 9/4/96 0945		Remarks Temp Lk 16.6°C							

Sample Delivery Group Narrative

September 20, 1996

Customer: Environmental Management Associates

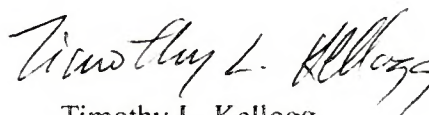
Project: CHEMGOLD IMPERIAL

Core Laboratories Project Number: 962419

During the analysis and subsequent data review, it was noted that a concentration of 0.15398 mg/L of iron was detected in the digestion blank for job 962419. When the sample was analyzed for iron, concentrations greater than 15 times the contamination in the method blank were found. Because the iron contamination was so far below the iron level in the sample this data was accepted and reported.



Linda L. Benkers
QA/QC Coordinator



Timothy L. Kellogg
Laboratory Supervisor



CORE LABORATORIES



CORE LABORATORIES

Sample Delivery Group Narrative

September 20, 1996

Customer: Environmental Management Associates
Project: Chemgold Imperial
Core Laboratories Project Number: 962419

The following information is pertinent to the interpretation of this data package.

Method 365.2 Total Phosphorous

The result reported for the 1312 extraction duplicate lies outside of the acceptance range of 20 RPD at 24 RPD. This appears to be a consequence of the particle size variability inherent in the extraction method. The extraction duplicate is flagged with a "*" on the quality control report.

A handwritten signature in cursive script, appearing to read "Linda L. Benkers".

Linda L. Benkers
QA/QC Coordinator

A handwritten signature in cursive script, appearing to read "Patrick J. McEntee".

Patrick J. McEntee
Laboratory Supervisor



CORE LABORATORIES

SAMPLE INFORMATION

Date: 09/25/96

Job Number.: 962419
Customer ..: Environmental Management Assoc.
Attn.....: John Heggeness

Project Number.....: 96000177
Customer Project ID....: CHEMGOLD IMPERIAL
Project Description....: Profile II Analysis

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
962419-1	TRIP BLANK	Water			09/04/96	09:45
962419-2	WC-5A	Water	08/28/96	10:30	09/04/96	09:45
962419-3	WC-5B	Water	08/29/96	10:00	09/04/96	09:45
962419-4	MW-1B	Water	08/29/96	12:00	09/04/96	09:45
962419-5	MW-1A	Water	08/29/96	12:30	09/04/96	09:45
962419-6	MW-2A	Water	08/29/96	17:00	09/04/96	09:45
962419-7	MW-2B	Water	08/29/96	17:00	09/04/96	09:45
962419-8	GOLDROCK	Water	08/30/96	09:30	09/04/96	09:45
962419-9	AA CANAL	Water	08/30/96	10:00	09/04/96	09:45
962419-10	EC-5A	Water	08/30/96	13:00	09/04/96	09:45
962419-11	EC-5B	Water	08/30/96	13:00	09/04/96	09:45



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: TRIP BLANK
Date Sampled.....:
Time Sampled.....:
Sample Matrix.....: Water

Laboratory Sample ID: 962419-1
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Filt.	<5	5	mg/L CaCO ₃	09/10/96	dem
EPA 325.2	Chloride, Filt.	<0.5	0.5	mg/L	09/12/96	sgm
EPA 340.2	Fluoride (F), Filt.	<0.1	0.1	mg/L	09/10/96	sgm
EPA 353.2	Nitrate + Nitrite as N, Filt.	<0.05	0.05	mg/L	09/11/96	dme
EPA 365.2	Phosphorous, Total, Filt.	<0.01	0.01	mg/L	09/05/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Filt.	20	10	mg/L	09/05/96	sgm
EPA 300.0	Sulfate (SO ₄), Filt.	<10	10	mg/L	09/12/96	dme
EPA 150.1	pH, Filt.	5.58	0.01	pH Units	09/10/96	dem
SW-846 6010A	Aluminum (Al), Diss.	<0.02	0.02	mg/L	09/05/96	s
SW-846 7041	Antimony (Sb), Diss.	<0.005	0.005	mg/L	09/11/96	lmt
SW-846 6010A	Arsenic (As), Diss.	<0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Barium (Ba), Diss.	<0.01	0.01	mg/L	09/05/96	smh
SW-846 6010A	Beryllium (Be), Diss.	<0.001	0.001	mg/L	09/13/96	smh
ASTM 3111B	Bismuth (Bi), Diss.	<1	1	mg/L	09/09/96	lmt
SW-846 6010A	Boron (B), Diss.	<0.05	0.05	mg/L	09/05/96	smh
SW-846 6010A	Cadmium (Cd), Diss.	<0.005	0.005	mg/L	09/05/96	smh
SW-846 6010A	Calcium (Ca), Diss.	<0.1	0.1	mg/L	09/05/96	smh
SW-846 6010A	Chromium (Cr), Diss.	<0.01	0.01	mg/L	09/05/96	smh
SW-846 6010A	Cobalt (Co), Diss.	<0.03	0.03	mg/L	09/05/96	smh
SW-846 6010A	Copper (Cu), Diss.	<0.01	0.01	mg/L	09/05/96	smh
ASTM 3111B	Gallium (Ga), Diss.	<0.5	0.5	mg/L	09/09/96	lmt
SW-846 6010A	Iron (Fe), Diss.	<0.03	0.03	mg/L	09/05/96	smh
SW-846 6010A	Lead (Pb), Diss.	<0.003	0.003	mg/L	09/13/96	smh
SW-846 6010A	Lithium (Li), Diss.	<0.01	0.01	mg/L	09/05/96	smh
SW-846 6010A	Magnesium (Mg), Diss.	<0.1	0.1	mg/L	09/05/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: TRIP BLANK
Date Sampled.....:
Time Sampled.....:
Sample Matrix.....: Water

Laboratory Sample ID: 962419-1
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Manganese (Mn), Diss.	<0.01	0.01	mg/L	09/05/96	smh
SW-846 7470	Mercury (Hg), Diss.	<0.0002	0.0002	mg/L	09/06/96	lmt
SW-846 6010A	Molybdenum (Mo), Diss.	<0.05	0.05	mg/L	09/05/96	smh
SW-846 6010A	Nickel (Ni), Diss.	<0.04	0.04	mg/L	09/05/96	smh
SW-846 6010A	Potassium (K), Diss.	<5	5	mg/L	09/05/96	smh
SW-846 6010A	Scandium (Sc), Diss.	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Selenium (Se), Diss.	<0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Silver (Ag), Diss.	<0.01	0.01	mg/L	09/05/96	smh
-846 6010A	Sodium (Na), Diss.	<1	1	mg/L	09/05/96	smh
SW-846 6010A	Strontium (Sr), Diss.	<0.01	0.01	mg/L	09/05/96	smh
SW-846 7841	Thallium (Tl), Diss.	<0.002	0.002	mg/L	09/06/96	lmt
SW-846 6010A	Tin (Sn), Diss.	<0.05	0.05	mg/L	09/05/96	smh
SW-846 6010A	Titanium (Ti), Diss.	<0.01	0.01	mg/L	09/05/96	smh
SW-846 6010A	Vanadium (V), Diss.	<0.05	0.05	mg/L	09/05/96	smh
SW-846 6010A	Zinc (Zn), Diss.	<0.01	0.01	mg/L	09/05/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: WC-5A
Date Sampled.....: 08/28/96
Time Sampled.....: 10:30
Sample Matrix.....: Water

Laboratory Sample ID: 962419-2
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Filt.	201	5	mg/L CaCO ₃	09/10/96	dem
EPA 325.2	Chloride, Filt.	162	1	mg/L	09/12/96	sgm
EPA 340.2	Fluoride (F), Filt.	0.8	0.1	mg/L	09/10/96	sgm
EPA 353.2	Nitrate + Nitrite as N, Filt.	0.06	0.05	mg/L	09/11/96	dme
EPA 365.2	Phosphorous, Total, Filt.	0.03	0.01	mg/L	09/05/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Filt.	1160	10	mg/L	09/04/96	sgm
EPA 375.2	Sulfate (SO ₄), Filt.	310	50	mg/L	09/09/96	sgm
EPA 150.1	pH, Filt.	7.61	0.01	pH Units	09/10/96	dem
SW-846 6010A	Aluminum (Al), Diss.	<0.02	0.02	mg/L	09/05/96	s
SW-846 7041	Antimony (Sb), Diss.	<0.005	0.005	mg/L	09/11/96	lmt
SW-846 6010A	Arsenic (As), Diss.	<0.01	0.01	mg/L	09/16/96	smh
SW-846 6010A	Barium (Ba), Diss.	0.03	0.01	mg/L	09/05/96	smh
SW-846 6010A	Beryllium (Be), Diss.	0.001	0.001	mg/L	09/16/96	smh
ASTM 3111B	Bismuth (Bi), Diss.	<1	1	mg/L	09/09/96	lmt
SW-846 6010A	Boron (B), Diss.	0.74	0.05	mg/L	09/05/96	smh
SW-846 6010A	Cadmium (Cd), Diss.	<0.005	0.005	mg/L	09/05/96	smh
SW-846 6010A	Calcium (Ca), Diss.	59.4	0.1	mg/L	09/05/96	smh
SW-846 6010A	Chromium (Cr), Diss.	<0.01	0.01	mg/L	09/05/96	smh
SW-846 6010A	Cobalt (Co), Diss.	<0.03	0.03	mg/L	09/05/96	smh
SW-846 6010A	Copper (Cu), Diss.	<0.01	0.01	mg/L	09/05/96	smh
ASTM 3111B	Gallium (Ga), Diss.	<0.5	0.5	mg/L	09/09/96	lmt
SW-846 6010A	Iron (Fe), Diss.	0.60	0.03	mg/L	09/05/96	smh
SW-846 6010A	Lead (Pb), Diss.	<0.003	0.003	mg/L	09/16/96	smh
SW-846 6010A	Lithium (Li), Diss.	0.07	0.01	mg/L	09/05/96	smh
SW-846 6010A	Magnesium (Mg), Diss.	16.1	0.1	mg/L	09/05/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: WC-5A
Date Sampled.....: 08/28/96
Time Sampled.....: 10:30
Sample Matrix.....: Water

Laboratory Sample ID: 962419-2
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Manganese (Mn), Diss.	0.47	0.01	mg/L	09/05/96	smh
SW-846 7470	Mercury (Hg), Diss.	<0.0002	0.0002	mg/L	09/06/96	lmt
SW-846 6010A	Molybdenum (Mo), Diss.	<0.05	0.05	mg/L	09/05/96	smh
SW-846 6010A	Nickel (Ni), Diss.	<0.04	0.04	mg/L	09/05/96	smh
SW-846 6010A	Potassium (K), Diss.	12	5	mg/L	09/05/96	smh
SW-846 6010A	Scandium (Sc), Diss.	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Selenium (Se), Diss.	<0.01	0.01	mg/L	09/16/96	smh
SW-846 6010A	Silver (Ag), Diss.	<0.01	0.01	mg/L	09/05/96	smh
I-846 6010A	Sodium (Na), Diss.	233	1	mg/L	09/05/96	smh
SW-846 6010A	Strontium (Sr), Diss.	1.30	0.01	mg/L	09/05/96	smh
SW-846 7841	Thallium (Tl), Diss.	<0.002	0.002	mg/L	09/06/96	lmt
SW-846 6010A	Tin (Sn), Diss.	<0.05	0.05	mg/L	09/05/96	smh
SW-846 6010A	Titanium (Ti), Diss.	<0.01	0.01	mg/L	09/05/96	smh
SW-846 6010A	Vanadium (V), Diss.	<0.05	0.05	mg/L	09/05/96	smh
SW-846 6010A	Zinc (Zn), Diss.	<0.01	0.01	mg/L	09/05/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: WC-5B
Date Sampled.....: 08/29/96
Time Sampled.....: 10:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-3
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Unfilt.	202	5	mg/L CaCO ₃	09/11/96	sgm
EPA 325.2	Chloride, Unfilt.	144	1	mg/L	09/12/96	sgm
EPA 340.2	Fluoride (F), Unfilt.	0.8	0.1	mg/L	09/10/96	sgm
EPA 353.2	Nitrate + Nitrite as N, Unfilt.	0.11	0.05	mg/L	09/11/96	dne
EPA 365.2	Phosphorous, Total, Unfilt.	0.13	0.01	mg/L	09/05/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Filt.	1060	10	mg/L	09/04/96	sgm
EPA 375.2	Sulfate (SO ₄), Unfilt.	324	50	mg/L	09/16/96	sgm
EPA 150.1	pH, Unfilt.	7.59	0.01	pH Units	09/11/96	sgm
SW-846 3010	Acid Digestion, Total Metals, Total	Complete			09/10/96	li
SW-846 3020	Acid Digestion, Total Metals (GFAA), Total	Complete			09/14/96	lmt
SW-846 6010A	Aluminum (Al), Total	0.32	0.02	mg/L	09/13/96	smh
SW-846 7041	Antimony (Sb), Total	<0.005	0.005	mg/L	09/17/96	lmt
SW-846 6010A	Arsenic (As), Total	<0.01	0.01	mg/L	09/17/96	smh
SW-846 6010A	Barium (Ba), Total	0.07	0.01	mg/L	09/11/96	smh
SW-846 6010A	Beryllium (Be), Total	<0.001	0.001	mg/L	09/17/96	smh
ASTM 3111B	Bismuth (Bi), Total	<1	1	mg/L	09/17/96	lmt
SW-846 6010A	Boron (B), Total	3.29	0.05	mg/L	09/13/96	smh
SW-846 6010A	Cadmium (Cd), Total	<0.005	0.005	mg/L	09/11/96	smh
SW-846 6010A	Calcium (Ca), Total	85.1	0.1	mg/L	09/11/96	smh
SW-846 6010A	Chromium (Cr), Total	0.08	0.01	mg/L	09/11/96	smh
SW-846 6010A	Cobalt (Co), Total	<0.03	0.03	mg/L	09/11/96	smh
SW-846 6010A	Copper (Cu), Total	0.02	0.01	mg/L	09/11/96	smh
ASTM 3111B	Gallium (Ga), Total	<0.5	0.5	mg/L	09/17/96	lmt
SW-846 6010A	Iron (Fe), Total	2.66	0.03	mg/L	09/11/96	smh
SW-846 6010A	Lead (Pb), Total	0.014	0.003	mg/L	09/17/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: WC-58
Date Sampled.....: 08/29/96
Time Sampled.....: 10:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-3
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Lithium (Li), Total	0.08	0.01	mg/L	09/17/96	gag
SW-846 6010A	Magnesium (Mg), Total	27.4	0.1	mg/L	09/11/96	smh
SW-846 6010A	Manganese (Mn), Total	0.35	0.01	mg/L	09/11/96	smh
SW-846 7470	Mercury (Hg), Total	<0.0002	0.0002	mg/L	09/13/96	lmt
SW-846 6010A	Molybdenum (Mo), Total	<0.05	0.05	mg/L	09/11/96	smh
SW-846 6010A	Nickel (Ni), Total	0.14	0.04	mg/L	09/11/96	smh
SW-846 6010A	Potassium (K), Total	10	5	mg/L	09/17/96	gag
SW-846 6010A	Scandium (Sc), Total	<0.01	0.01	mg/L	09/17/96	gag
I-846 6010A	Selenium (Se), Total	<0.01	0.01	mg/L	09/17/96	smh
SW-846 6010A	Silver (Ag), Total	<0.01	0.01	mg/L	09/11/96	smh
SW-846 6010A	Sodium (Na), Total	176	1	mg/L	09/11/96	smh
SW-846 6010A	Strontium (Sr), Total	1.35	0.01	mg/L	09/11/96	smh
SW-846 7841	Thallium (Tl), Total	<0.005	0.005	mg/L	09/16/96	lmt
SW-846 6010A	Tin (Sn), Total	<0.05	0.05	mg/L	09/17/96	gag
SW-846 6010A	Titanium (Ti), Total	<0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Vanadium (V), Total	<0.05	0.05	mg/L	09/13/96	smh
SW-846 6010A	Zinc (Zn), Total	0.14	0.01	mg/L	09/11/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: MW-1B
Date Sampled.....: 08/29/96
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-4
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Unfilt.	186	5	mg/L CaCO ₃	09/11/96	sgm
EPA 325.2	Chloride, Unfilt.	61.1	0.5	mg/L	09/12/96	sgm
EPA 340.2	Fluoride (F), Unfilt.	0.6	0.1	mg/L	09/10/96	sgm
EPA 353.2	Nitrate + Nitrite as N, Unfilt.	0.05	0.05	mg/L	09/11/96	dme
EPA 365.2	Phosphorous, Total, Unfilt.	0.31	0.01	mg/L	09/05/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Filt.	640	10	mg/L	09/04/96	sgm
EPA 375.2	Sulfate (SO ₄), Unfilt.	211	50	mg/L	09/16/96	sgm
EPA 150.1	pH, Unfilt.	7.51	0.01	pH Units	09/11/96	sam
SW-846 3010	Acid Digestion, Total Metals, Total	Complete			09/10/96	l
SW-846 3020	Acid Digestion, Total Metals (GFAA), Total	Complete			09/14/96	lmt
SW-846 6010A	Aluminum (Al), Total	1.37	0.02	mg/L	09/13/96	smh
SW-846 7041	Antimony (Sb), Total	<0.005	0.005	mg/L	09/17/96	lmt
SW-846 6010A	Arsenic (As), Total	0.01	0.01	mg/L	09/17/96	smh
SW-846 6010A	Barium (Ba), Total	0.21	0.01	mg/L	09/11/96	smh
SW-846 6010A	Beryllium (Be), Total	0.001	0.001	mg/L	09/17/96	smh
ASTM 3111B	Bismuth (Bi), Total	<1	1	mg/L	09/17/96	lmt
SW-846 6010A	Boron (B), Total	0.53	0.05	mg/L	09/13/96	smh
SW-846 6010A	Cadmium (Cd), Total	<0.005	0.005	mg/L	09/11/96	smh
SW-846 6010A	Calcium (Ca), Total	57.1	0.1	mg/L	09/11/96	smh
SW-846 6010A	Chromium (Cr), Total	0.03	0.01	mg/L	09/11/96	smh
SW-846 6010A	Cobalt (Co), Total	<0.03	0.03	mg/L	09/11/96	smh
SW-846 6010A	Copper (Cu), Total	<0.01	0.01	mg/L	09/11/96	smh
ASTM 3111B	Gallium (Ga), Total	<0.5	0.5	mg/L	09/17/96	lmt
SW-846 6010A	Iron (Fe), Total	4.39	0.03	mg/L	09/11/96	smh
SW-846 6010A	Lead (Pb), Total	0.049	0.003	mg/L	09/17/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: MW-18
Date Sampled.....: 08/29/96
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-4
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Lithium (Li), Total	0.06	0.01	mg/L	09/17/96	gag
SW-846 6010A	Magnesium (Mg), Total	5.7	0.1	mg/L	09/11/96	smh
SW-846 6010A	Manganese (Mn), Total	1.10	0.01	mg/L	09/11/96	smh
SW-846 7470	Mercury (Hg), Total	<0.0002	0.0002	mg/L	09/13/96	lmt
SW-846 6010A	Molybdenum (Mo), Total	<0.05	0.05	mg/L	09/11/96	smh
SW-846 6010A	Nickel (Ni), Total	0.04	0.04	mg/L	09/11/96	smh
SW-846 6010A	Potassium (K), Total	10	5	mg/L	09/17/96	gag
SW-846 6010A	Scandium (Sc), Total	<0.01	0.01	mg/L	09/17/96	gag
I-846 6010A	Selenium (Se), Total	<0.01	0.01	mg/L	09/17/96	smh
SW-846 6010A	Silver (Ag), Total	<0.01	0.01	mg/L	09/11/96	smh
SW-846 6010A	Sodium (Na), Total	135	1	mg/L	09/11/96	smh
SW-846 6010A	Strontium (Sr), Total	4.19	0.01	mg/L	09/11/96	smh
SW-846 7841	Thallium (Tl), Total	<0.005	0.005	mg/L	09/16/96	lmt
SW-846 6010A	Tin (Sn), Total	<0.05	0.05	mg/L	09/17/96	gag
SW-846 6010A	Titanium (Ti), Total	<0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Vanadium (V), Total	<0.05	0.05	mg/L	09/13/96	smh
SW-846 6010A	Zinc (Zn), Total	0.06	0.01	mg/L	09/11/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: MW-1A
Date Sampled.....: 08/29/96
Time Sampled.....: 12:30
Sample Matrix.....: Water

Laboratory Sample ID: 962419-5
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Filt.	163	5	mg/L CaCO ₃	09/10/96	dem
EPA 325.2	Chloride, Filt.	56.1	0.5	mg/L	09/12/96	sgm
EPA 340.2	Fluoride (F), Filt.	0.6	0.1	mg/L	09/10/96	sgm
EPA 353.2	Nitrate + Nitrite as N, Filt.	0.13	0.05	mg/L	09/11/96	dme
EPA 365.2	Phosphorous, Total, Filt.	0.09	0.01	mg/L	09/05/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Filt.	620	10	mg/L	09/04/96	sgm
EPA 375.2	Sulfate (SO ₄), Filt.	230	50	mg/L	09/09/96	sgm
EPA 150.1	pH, Filt.	7.69	0.01	pH Units	09/10/96	dem
SW-846 6010A	Aluminum (Al), Diss.	<0.02	0.02	mg/L	09/05/96	s
SW-846 7041	Antimony (Sb), Diss.	<0.005	0.005	mg/L	09/11/96	lmt
SW-846 6010A	Arsenic (As), Diss.	<0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Barium (Ba), Diss.	0.17	0.01	mg/L	09/05/96	smh
SW-846 6010A	Beryllium (Be), Diss.	<0.001	0.001	mg/L	09/13/96	smh
ASTM 3111B	Bismuth (Bi), Diss.	<1	1	mg/L	09/09/96	lmt
SW-846 6010A	Boron (B), Diss.	0.50	0.05	mg/L	09/05/96	smh
SW-846 6010A	Cadmium (Cd), Diss.	<0.005	0.005	mg/L	09/05/96	smh
SW-846 6010A	Calcium (Ca), Diss.	49.4	0.1	mg/L	09/05/96	smh
SW-846 6010A	Chromium (Cr), Diss.	<0.01	0.01	mg/L	09/05/96	smh
SW-846 6010A	Cobalt (Co), Diss.	<0.03	0.03	mg/L	09/05/96	smh
SW-846 6010A	Copper (Cu), Diss.	<0.01	0.01	mg/L	09/05/96	smh
ASTM 3111B	Gallium (Ga), Diss.	<0.5	0.5	mg/L	09/09/96	lmt
SW-846 6010A	Iron (Fe), Diss.	<0.03	0.03	mg/L	09/05/96	smh
SW-846 6010A	Lead (Pb), Diss.	<0.003	0.003	mg/L	09/13/96	smh
SW-846 6010A	Lithium (Li), Diss.	0.04	0.01	mg/L	09/05/96	smh
SW-846 6010A	Magnesium (Mg), Diss.	5.3	0.1	mg/L	09/05/96	smh



Date: 09/25/96

ATTN: John Heggeness

Laboratory Sample ID: 962419-5
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Manganese (Mn), Diss.	0.70	0.01	mg/L	09/05/96	smh
SW-846 7470	Mercury (Hg), Diss.	<0.0002	0.0002	mg/L	09/06/96	lmt
SW-846 6010A	Molybdenum (Mo), Diss.	<0.05	0.05	mg/L	09/05/96	smh
SW-846 6010A	Nickel (Ni), Diss.	<0.04	0.04	mg/L	09/05/96	smh
SW-846 6010A	Potassium (K), Diss.	6	5	mg/L	09/05/96	smh
SW-846 6010A	Scandium (Sc), Diss.	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Selenium (Se), Diss.	<0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Silver (Ag), Diss.	<0.01	0.01	mg/L	09/05/96	smh
SW-846 6010A	Sodium (Na), Diss.	159	1	mg/L	09/05/96	smh
SW-846 6010A	Strontium (Sr), Diss.	4.28	0.01	mg/L	09/05/96	smh
SW-846 7841	Thallium (Tl), Diss.	<0.002	0.002	mg/L	09/06/96	lmt
SW-846 6010A	Tin (Sn), Diss.	<0.05	0.05	mg/L	09/05/96	smh
SW-846 6010A	Titanium (Ti), Diss.	<0.01	0.01	mg/L	09/05/96	smh
SW-846 6010A	Vanadium (V), Diss.	<0.05	0.05	mg/L	09/05/96	smh
SW-846 6010A	Zinc (Zn), Diss.	<0.01	0.01	mg/L	09/05/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: MW-2A
Date Sampled.....: 08/29/96
Time Sampled.....: 17:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-6
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Filt.	95	5	mg/L CaCO ₃	09/10/96	dem
EPA 325.2	Chloride, Filt.	641	5	mg/L	09/12/96	sgm
EPA 340.2	Fluoride (F), Filt.	0.6	0.1	mg/L	09/10/96	sgm
EPA 353.2	Nitrate + Nitrite as N, Filt.	0.07	0.05	mg/L	09/11/96	dme
EPA 365.2	Phosphorous, Total, Filt.	0.03	0.01	mg/L	09/05/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Filt.	1780	10	mg/L	09/05/96	sgm
EPA 375.2	Sulfate (SO ₄), Filt.	360	100	mg/L	09/09/96	sgm
EPA 150.1	pH, Filt.	7.70	0.01	pH Units	09/10/96	dem
SW-846 6010A	Aluminum (Al), Diss.	<0.02	0.02	mg/L	09/06/96	s
SW-846 7041	Antimony (Sb), Diss.	<0.005	0.005	mg/L	09/11/96	lmt
SW-846 6010A	Arsenic (As), Diss.	0.09	0.01	mg/L	09/13/96	smh
SW-846 6010A	Barium (Ba), Diss.	0.04	0.01	mg/L	09/06/96	smh
SW-846 6010A	Beryllium (Be), Diss.	<0.001	0.001	mg/L	09/13/96	smh
ASTM 3111B	Bismuth (Bi), Diss.	<1	1	mg/L	09/09/96	lmt
SW-846 6010A	Boron (B), Diss.	4.95	0.05	mg/L	09/06/96	smh
SW-846 6010A	Cadmium (Cd), Diss.	<0.005	0.005	mg/L	09/06/96	smh
SW-846 6010A	Calcium (Ca), Diss.	67.3	0.1	mg/L	09/06/96	smh
SW-846 6010A	Chromium (Cr), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 6010A	Cobalt (Co), Diss.	<0.03	0.03	mg/L	09/06/96	smh
SW-846 6010A	Copper (Cu), Diss.	<0.01	0.01	mg/L	09/06/96	smh
ASTM 3111B	Gallium (Ga), Diss.	<0.5	0.5	mg/L	09/09/96	lmt
SW-846 6010A	Iron (Fe), Diss.	<0.03	0.03	mg/L	09/06/96	smh
SW-846 6010A	Lead (Pb), Diss.	<0.003	0.003	mg/L	09/13/96	smh
SW-846 6010A	Lithium (Li), Diss.	0.58	0.01	mg/L	09/06/96	smh
SW-846 6010A	Magnesium (Mg), Diss.	19.0	0.1	mg/L	09/06/96	smh



CORE LABORATORIES

Job Number: 962419	LABORATORY TEST RESULTS	Date: 09/25/96
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CUSTOMER: Environmental Management Assoc.	PROJECT: CHEMGOLD IMPERIAL	ATTN: John Heggeness
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Customer Sample ID: MW-2A
Date Sampled.....: 08/29/96
Time Sampled.....: 17:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-6
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Manganese (Mn), Diss.	0.09	0.01	mg/L	09/06/96	smh
SW-846 7470	Mercury (Hg), Diss.	<0.0002	0.0002	mg/L	09/06/96	lmt
SW-846 6010A	Molybdenum (Mo), Diss.	0.12	0.05	mg/L	09/06/96	smh
SW-846 6010A	Nickel (Ni), Diss.	<0.04	0.04	mg/L	09/06/96	smh
SW-846 6010A	Potassium (K), Diss.	10	5	mg/L	09/06/96	smh
SW-846 6010A	Scandium (Sc), Diss.	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Selenium (Se), Diss.	<0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Silver (Ag), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 6010A	Sodium (Na), Diss.	537	1	mg/L	09/06/96	smh
SW-846 6010A	Strontium (Sr), Diss.	2.57	0.01	mg/L	09/06/96	smh
SW-846 7841	Thallium (Tl), Diss.	<0.002	0.002	mg/L	09/06/96	lmt
SW-846 6010A	Tin (Sn), Diss.	<0.05	0.05	mg/L	09/06/96	smh
SW-846 6010A	Titanium (Ti), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 6010A	Vanadium (V), Diss.	<0.05	0.05	mg/L	09/06/96	smh
SW-846 6010A	Zinc (Zn), Diss.	<0.01	0.01	mg/L	09/06/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: MW-2B
Date Sampled.....: 08/29/96
Time Sampled.....: 17:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-7
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Unfilt.	195	5	mg/L CaCO ₃	09/11/96	sgm
EPA 325.2	Chloride, Unfilt.	606	5	mg/L	09/12/96	sgm
EPA 340.2	Fluoride (F), Unfilt.	0.6	0.1	mg/L	09/10/96	sgm
EPA 353.2	Nitrate + Nitrite as N, Unfilt.	<0.05	0.05	mg/L	09/11/96	dme
EPA 365.2	Phosphorous, Total, Unfilt.	0.80	0.01	mg/L	09/05/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Filt.	1690	10	mg/L	09/05/96	sgm
EPA 375.2	Sulfate (SO ₄), Unfilt.	230	100	mg/L	09/16/96	sgm
EPA 150.1	pH, Unfilt.	7.64	0.01	pH Units	09/11/96	sam
SW-846 3010	Acid Digestion, Total Metals, Total	Complete			09/10/96	l
SW-846 3020	Acid Digestion, Total Metals (GFAA), Total	Complete			09/14/96	lmt
SW-846 6010A	Aluminum (Al), Total	4.03	0.02	mg/L	09/13/96	smh
SW-846 7041	Antimony (Sb), Total	<0.005	0.005	mg/L	09/17/96	lmt
SW-846 6010A	Arsenic (As), Total	0.11	0.01	mg/L	09/17/96	smh
SW-846 6010A	Barium (Ba), Total	0.08	0.01	mg/L	09/11/96	smh
SW-846 6010A	Beryllium (Be), Total	0.002	0.001	mg/L	09/17/96	smh
ASTM 3111B	Bismuth (Bi), Total	<1	1	mg/L	09/17/96	lmt
SW-846 6010A	Boron (B), Total	5.06	0.05	mg/L	09/13/96	smh
SW-846 6010A	Cadmium (Cd), Total	<0.005	0.005	mg/L	09/11/96	smh
SW-846 6010A	Calcium (Ca), Total	108	0.1	mg/L	09/11/96	smh
SW-846 6010A	Chromium (Cr), Total	0.07	0.01	mg/L	09/11/96	smh
SW-846 6010A	Cobalt (Co), Total	<0.03	0.03	mg/L	09/11/96	smh
SW-846 6010A	Copper (Cu), Total	0.03	0.01	mg/L	09/11/96	smh
ASTM 3111B	Gallium (Ga), Total	<0.5	0.5	mg/L	09/17/96	lmt
SW-846 6010A	Iron (Fe), Total	6.64	0.03	mg/L	09/11/96	smh
SW-846 6010A	Lead (Pb), Total	0.024	0.003	mg/L	09/17/96	smh



CORE LABORATORIES

Job Number: 962419	LABORATORY TEST RESULTS	Date: 09/25/96
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CUSTOMER: Environmental Management Assoc.	PROJECT: CHEMGOLD IMPERIAL	ATTN: John Heggeness
Customer Sample ID: MW-2B Date Sampled.....: 08/29/96 Time Sampled.....: 17:00 Sample Matrix.....: Water	Laboratory Sample ID: 962419-7 Date Received.....: 09/04/96 Time Received.....: 09:45	

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Lithium (Li), Total	0.67	0.01	mg/L	09/17/96	gag
SW-846 6010A	Magnesium (Mg), Total	27.5	0.1	mg/L	09/11/96	smh
SW-846 6010A	Manganese (Mn), Total	0.50	0.01	mg/L	09/11/96	smh
SW-846 7470	Mercury (Hg), Total	<0.0002	0.0002	mg/L	09/13/96	lmt
SW-846 6010A	Molybdenum (Mo), Total	0.06	0.05	mg/L	09/11/96	smh
SW-846 6010A	Nickel (Ni), Total	0.08	0.04	mg/L	09/11/96	smh
SW-846 6010A	Potassium (K), Total	20	5	mg/L	09/17/96	gag
SW-846 6010A	Scandium (Sc), Total	<0.01	0.01	mg/L	09/17/96	gag
SW-846 6010A	Selenium (Se), Total	<0.01	0.01	mg/L	09/17/96	smh
SW-846 6010A	Silver (Ag), Total	<0.01	0.01	mg/L	09/11/96	smh
SW-846 6010A	Sodium (Na), Total	463	1	mg/L	09/11/96	smh
SW-846 6010A	Strontium (Sr), Total	2.61	0.01	mg/L	09/11/96	smh
SW-846 7841	Thallium (Tl), Total	<0.005	0.005	mg/L	09/16/96	lmt
SW-846 6010A	Tin (Sn), Total	<0.05	0.05	mg/L	09/17/96	gag
SW-846 6010A	Titanium (Ti), Total	0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Vanadium (V), Total	<0.05	0.05	mg/L	09/13/96	smh
SW-846 6010A	Zinc (Zn), Total	0.26	0.01	mg/L	09/11/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS		
Job Number: 962419		Date: 09/25/96

CUSTOMER: Environmental Management Assoc.	PROJECT: CHEMGOLD IMPERIAL	ATTN: John Heggeness
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Customer Sample ID: GOLDROCK Date Sampled.....: 08/30/96 Time Sampled.....: 09:30 Sample Matrix.....: Water	Laboratory Sample ID: 962419-8 Date Received.....: 09/04/96 Time Received.....: 09:45
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TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Filt.	75	5	mg/L CaCO ₃	09/10/96	dem
EPA 325.2	Chloride, Filt.	351	5	mg/L	09/12/96	sgm
EPA 340.2	Fluoride (F), Filt.	3.0	0.1	mg/L	09/10/96	sgm
EPA 353.2	Nitrate + Nitrite as N, Filt.	1.52	0.05	mg/L	09/11/96	dme
EPA 365.2	Phosphorous, Total, Filt.	0.02	0.01	mg/L	09/05/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Filt.	920	10	mg/L	09/05/96	sgm
EPA 300.0	Sulfate (SO ₄), Filt.	130	20	mg/L	09/12/96	dme
EPA 150.1	pH, Filt.	7.74	0.01	pH Units	09/10/96	dem
SW-846 6010A	Aluminum (Al), Diss.	<0.02	0.02	mg/L	09/06/96	s
SW-846 7041	Antimony (Sb), Diss.	<5E-03	5E-03	mg/L	09/11/96	lmt
SW-846 6010A	Arsenic (As), Diss.	0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Barium (Ba), Diss.	0.06	0.01	mg/L	09/06/96	smh
SW-846 6010A	Beryllium (Be), Diss.	<0.001	0.001	mg/L	09/13/96	smh
ASTM 3111B	Bismuth (Bi), Diss.	<1	1	mg/L	09/09/96	lmt
SW-846 6010A	Boron (B), Diss.	0.90	0.05	mg/L	09/06/96	smh
SW-846 6010A	Cadmium (Cd), Diss.	<0.005	0.005	mg/L	09/06/96	smh
SW-846 6010A	Calcium (Ca), Diss.	31.0	0.1	mg/L	09/06/96	smh
SW-846 6010A	Chromium (Cr), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 6010A	Cobalt (Co), Diss.	<0.03	0.03	mg/L	09/06/96	smh
SW-846 6010A	Copper (Cu), Diss.	<0.01	0.01	mg/L	09/06/96	smh
ASTM 3111B	Gallium (Ga), Diss.	<0.5	0.5	mg/L	09/09/96	lmt
SW-846 6010A	Iron (Fe), Diss.	<0.03	0.03	mg/L	09/06/96	smh
SW-846 6010A	Lead (Pb), Diss.	<0.003	0.003	mg/L	09/13/96	smh
SW-846 6010A	Lithium (Li), Diss.	0.09	0.01	mg/L	09/06/96	smh
SW-846 6010A	Magnesium (Mg), Diss.	0.6	0.1	mg/L	09/06/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: GOLDROCK
Date Sampled.....: 08/30/96
Time Sampled.....: 09:30
Sample Matrix.....: Water

Laboratory Sample ID: 962419-8
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Manganese (Mn), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 7470	Mercury (Hg), Diss.	<0.0002	0.0002	mg/L	09/06/96	lmt
SW-846 6010A	Molybdenum (Mo), Diss.	<0.05	0.05	mg/L	09/06/96	smh
SW-846 6010A	Nickel (Ni), Diss.	<0.04	0.04	mg/L	09/06/96	smh
SW-846 6010A	Potassium (K), Diss.	6	5	mg/L	09/06/96	smh
SW-846 6010A	Scandium (Sc), Diss.	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Selenium (Se), Diss.	0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Silver (Ag), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 6010A	Sodium (Na), Diss.	300	1	mg/L	09/06/96	smh
SW-846 6010A	Strontium (Sr), Diss.	1.01	0.01	mg/L	09/06/96	smh
SW-846 7841	Thallium (Tl), Diss.	<0.002	0.002	mg/L	09/06/96	lmt
SW-846 6010A	Tin (Sn), Diss.	<0.05	0.05	mg/L	09/06/96	smh
SW-846 6010A	Titanium (Ti), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 6010A	Vanadium (V), Diss.	<0.05	0.05	mg/L	09/06/96	smh
SW-846 6010A	Zinc (Zn), Diss.	0.02	0.01	mg/L	09/06/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: AA CANAL
Date Sampled.....: 08/30/96
Time Sampled.....: 10:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-9
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Filt.	154	5	mg/L CaCO ₃	09/10/96	dem
EPA 325.2	Chloride, Filt.	119	0.5	mg/L	09/12/96	sgm
EPA 340.2	Fluoride (F), Filt.	0.6	0.1	mg/L	09/10/96	sgm
EPA 353.2	Nitrate + Nitrite as N, Filt.	0.35	0.05	mg/L	09/11/96	dme
EPA 365.2	Phosphorous, Total, Filt.	<0.01	0.01	mg/L	09/05/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Filt.	820	10	mg/L	09/05/96	sgm
EPA 375.2	Sulfate (SO ₄), Filt.	309	50	mg/L	09/09/96	sgm
EPA 150.1	pH, Filt.	8.10	0.01	pH Units	09/10/96	dem
SW-846 6010A	Aluminum (Al), Diss.	<0.02	0.02	mg/L	09/06/96	s
SW-846 7041	Antimony (Sb), Diss.	<0.005	0.005	mg/L	09/13/96	lmt
SW-846 6010A	Arsenic (As), Diss.	<0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Barium (Ba), Diss.	0.12	0.01	mg/L	09/06/96	smh
SW-846 6010A	Beryllium (Be), Diss.	<0.001	0.001	mg/L	09/13/96	smh
ASTM 3111B	Bismuth (Bi), Diss.	<1	1	mg/L	09/09/96	lmt
SW-846 6010A	Boron (B), Diss.	0.16	0.05	mg/L	09/06/96	smh
SW-846 6010A	Cadmium (Cd), Diss.	<0.005	0.005	mg/L	09/06/96	smh
SW-846 6010A	Calcium (Ca), Diss.	86.4	0.1	mg/L	09/06/96	smh
SW-846 6010A	Chromium (Cr), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 6010A	Cobalt (Co), Diss.	<0.03	0.03	mg/L	09/06/96	smh
SW-846 6010A	Copper (Cu), Diss.	<0.01	0.01	mg/L	09/06/96	smh
ASTM 3111B	Gallium (Ga), Diss.	<0.5	0.5	mg/L	09/09/96	lmt
SW-846 6010A	Iron (Fe), Diss.	<0.03	0.03	mg/L	09/06/96	smh
SW-846 6010A	Lead (Pb), Diss.	<0.003	0.003	mg/L	09/13/96	smh
SW-846 6010A	Lithium (Li), Diss.	0.06	0.01	mg/L	09/06/96	smh
SW-846 6010A	Magnesium (Mg), Diss.	32.8	0.1	mg/L	09/06/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: AA CANAL
Date Sampled.....: 08/30/96
Time Sampled.....: 10:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-9
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Manganese (Mn), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 7470	Mercury (Hg), Diss.	<0.0002	0.0002	mg/L	09/06/96	lmt
SW-846 6010A	Molybdenum (Mo), Diss.	<0.05	0.05	mg/L	09/06/96	smh
SW-846 6010A	Nickel (Ni), Diss.	<0.04	0.04	mg/L	09/06/96	smh
SW-846 6010A	Potassium (K), Diss.	6	5	mg/L	09/06/96	smh
SW-846 6010A	Scandium (Sc), Diss.	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Selenium (Se), Diss.	<0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Silver (Ag), Diss.	<0.01	0.01	mg/L	09/06/96	smh
-846 6010A	Sodium (Na), Diss.	137	1	mg/L	09/06/96	smh
SW-846 6010A	Strontium (Sr), Diss.	1.23	0.01	mg/L	09/06/96	smh
SW-846 7841	Thallium (Tl), Diss.	<0.002	0.002	mg/L	09/06/96	lmt
SW-846 6010A	Tin (Sn), Diss.	<0.05	0.05	mg/L	09/06/96	smh
SW-846 6010A	Titanium (Ti), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 6010A	Vanadium (V), Diss.	<0.05	0.05	mg/L	09/06/96	smh
SW-846 6010A	Zinc (Zn), Diss.	0.01	0.01	mg/L	09/06/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: EC-5A
Date Sampled.....: 08/30/96
Time Sampled.....: 13:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-10
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Filt.	400	5	mg/L CaCO ₃	09/10/96	dem
EPA 325.2	Chloride, Filt.	204	1	mg/L	09/12/96	sgm
EPA 340.2	Fluoride (F), Filt.	0.8	0.1	mg/L	09/10/96	sgm
EPA 353.2	Nitrate + Nitrite as N, Filt.	0.44	0.05	mg/L	09/11/96	dme
EPA 365.2	Phosphorous, Total, Filt.	0.66	0.01	mg/L	09/05/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Filt.	4440	10	mg/L	09/05/96	sgm
EPA 300.0	Sulfate (SO ₄), Filt.	140	20	mg/L	09/12/96	dme
EPA 150.1	pH, Filt.	8.48	0.01	pH Units	09/10/96	dem
SW-846 6010A	Aluminum (Al), Diss.	<0.02	0.02	mg/L	09/06/96	s
SW-846 7041	Antimony (Sb), Diss.	<0.005	0.005	mg/L	09/13/96	lmt
SW-846 6010A	Arsenic (As), Diss.	<0.01	0.01	mg/L	09/16/96	smh
SW-846 6010A	Barium (Ba), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 6010A	Beryllium (Be), Diss.	0.002	0.001	mg/L	09/16/96	smh
ASTM 3111B	Bismuth (Bi), Diss.	<1	1	mg/L	09/09/96	lmt
SW-846 6010A	Boron (B), Diss.	0.12	0.05	mg/L	09/06/96	smh
SW-846 6010A	Cadmium (Cd), Diss.	<0.005	0.005	mg/L	09/06/96	smh
SW-846 6010A	Calcium (Ca), Diss.	32.3	0.1	mg/L	09/06/96	smh
SW-846 6010A	Chromium (Cr), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 6010A	Cobalt (Co), Diss.	<0.03	0.03	mg/L	09/06/96	smh
SW-846 6010A	Copper (Cu), Diss.	<0.01	0.01	mg/L	09/06/96	smh
ASTM 3111B	Gallium (Ga), Diss.	<0.5	0.5	mg/L	09/09/96	lmt
SW-846 6010A	Iron (Fe), Diss.	0.11	0.03	mg/L	09/06/96	smh
SW-846 6010A	Lead (Pb), Diss.	<0.003	0.003	mg/L	09/16/96	smh
SW-846 6010A	Lithium (Li), Diss.	0.08	0.01	mg/L	09/06/96	smh
SW-846 6010A	Magnesium (Mg), Diss.	5.3	0.1	mg/L	09/06/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: EC-5A
Date Sampled.....: 08/30/96
Time Sampled.....: 13:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-10
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Manganese (Mn), Diss.	2.01	0.01	mg/L	09/06/96	smh
SW-846 7470	Mercury (Hg), Diss.	0.0005	0.0002	mg/L	09/06/96	lmt
SW-846 6010A	Molybdenum (Mo), Diss.	<0.05	0.05	mg/L	09/06/96	smh
SW-846 6010A	Nickel (Ni), Diss.	<0.04	0.04	mg/L	09/06/96	smh
SW-846 6010A	Potassium (K), Diss.	26	5	mg/L	09/06/96	smh
SW-846 6010A	Scandium (Sc), Diss.	<0.01	0.01	mg/L	09/12/96	gag
SW-846 6010A	Selenium (Se), Diss.	<0.01	0.01	mg/L	09/16/96	smh
SW-846 6010A	Silver (Ag), Diss.	<0.01	0.01	mg/L	09/06/96	smh
I-846 6010A	Sodium (Na), Diss.	194	1	mg/L	09/06/96	smh
SW-846 6010A	Strontium (Sr), Diss.	0.67	0.01	mg/L	09/06/96	smh
SW-846 7841	Thallium (Tl), Diss.	<0.002	0.002	mg/L	09/06/96	lmt
SW-846 6010A	Tin (Sn), Diss.	<0.05	0.05	mg/L	09/06/96	smh
SW-846 6010A	Titanium (Ti), Diss.	<0.01	0.01	mg/L	09/06/96	smh
SW-846 6010A	Vanadium (V), Diss.	<0.05	0.05	mg/L	09/06/96	smh
SW-846 6010A	Zinc (Zn), Diss.	<0.01	0.01	mg/L	09/06/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: EC-5B
Date Sampled.....: 08/30/96
Time Sampled.....: 13:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-11
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 310.1	Alkalinity, Total as CaCO ₃ , Unfilt.	910	5	mg/L CaCO ₃	09/11/96	sgm
EPA 325.2	Chloride, Unfilt.	1450	3	mg/L	09/12/96	sgm
EPA 340.2	Fluoride (F), Unfilt.	0.8	0.1	mg/L	09/10/96	sgm
EPA 353.2	Nitrate + Nitrite as N, Unfilt.	<0.05	0.05	mg/L	09/11/96	dme
EPA 365.2	Phosphorous, Total, Unfilt.	0.07	0.01	mg/L	09/09/96	sgm
EPA 160.1	Solids, Total Dissolved (TDS), Filt.	6010	10	mg/L	09/05/96	sgm
EPA 375.2	Sulfate (SO ₄), Unfilt.	130	10.	mg/L	09/16/96	sgm
EPA 150.1	pH, Unfilt.	7.43	0.01	pH Units	09/11/96	sgm
SW-846 3010	Acid Digestion, Total Metals, Total	Complete			09/10/96	l
SW-846 3020	Acid Digestion, Total Metals (GFAA), Total	Complete			09/14/96	lmt
SW-846 6010A	Aluminum (Al), Total	0.54	0.02	mg/L	09/13/96	smh
SW-846 7041	Antimony (Sb), Total	<0.005	0.005	mg/L	09/17/96	lmt
SW-846 6010A	Arsenic (As), Total	<0.01	0.01	mg/L	09/17/96	smh
SW-846 6010A	Barium (Ba), Total	0.07	0.01	mg/L	09/11/96	smh
SW-846 6010A	Beryllium (Be), Total	<0.001	0.001	mg/L	09/17/96	smh
ASTM 3111B	Bismuth (Bi), Total	<1	1	mg/L	09/17/96	lmt
SW-846 6010A	Boron (B), Total	0.24	0.05	mg/L	09/13/96	smh
SW-846 6010A	Cadmium (Cd), Total	<0.005	0.005	mg/L	09/11/96	smh
SW-846 6010A	Calcium (Ca), Total	221	0.1	mg/L	09/11/96	smh
SW-846 6010A	Chromium (Cr), Total	0.11	0.01	mg/L	09/11/96	smh
SW-846 6010A	Cobalt (Co), Total	<0.03	0.03	mg/L	09/11/96	smh
SW-846 6010A	Copper (Cu), Total	0.07	0.01	mg/L	09/11/96	smh
ASTM 3111B	Gallium (Ga), Total	<0.5	0.5	mg/L	09/17/96	lmt
SW-846 6010A	Iron (Fe), Total	2.36	0.03	mg/L	09/11/96	smh
SW-846 6010A	Lead (Pb), Total	0.008	0.003	mg/L	09/17/96	smh



CORE LABORATORIES

LABORATORY TEST RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Customer Sample ID: EC-5B
Date Sampled.....: 08/30/96
Time Sampled.....: 13:00
Sample Matrix.....: Water

Laboratory Sample ID: 962419-11
Date Received.....: 09/04/96
Time Received.....: 09:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
SW-846 6010A	Lithium (Li), Total	0.20	0.01	mg/L	09/17/96	gag
SW-846 6010A	Magnesium (Mg), Total	37.7	0.1	mg/L	09/11/96	smh
SW-846 6010A	Manganese (Mn), Total	20.1	0.05	mg/L	09/11/96	smh
SW-846 7470	Mercury (Hg), Total	0.0027	0.0002	mg/L	09/13/96	lmt
SW-846 6010A	Molybdenum (Mo), Total	<0.05	0.05	mg/L	09/11/96	smh
SW-846 6010A	Nickel (Ni), Total	0.10	0.04	mg/L	09/11/96	smh
SW-846 6010A	Potassium (K), Total	18	5	mg/L	09/17/96	gag
SW-846 6010A	Scandium (Sc), Total	<0.01	0.01	mg/L	09/17/96	gag
SW-846 6010A	Selenium (Se), Total	<0.01	0.01	mg/L	09/17/96	smh
SW-846 6010A	Silver (Ag), Total	<0.01	0.01	mg/L	09/11/96	smh
SW-846 6010A	Sodium (Na), Total	349	5	mg/L	09/11/96	smh
SW-846 6010A	Strontium (Sr), Total	5.46	0.01	mg/L	09/11/96	smh
SW-846 7841	Thallium (Tl), Total	<0.005	0.005	mg/L	09/16/96	lmt
SW-846 6010A	Tin (Sn), Total	<0.05	0.05	mg/L	09/17/96	gag
SW-846 6010A	Titanium (Ti), Total	0.01	0.01	mg/L	09/13/96	smh
SW-846 6010A	Vanadium (V), Total	<0.05	0.05	mg/L	09/13/96	smh
SW-846 6010A	Zinc (Zn), Total	0.12	0.01	mg/L	09/11/96	smh



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: EPA 160.1

Method Description.: Solids, Total Dissolved (TDS)

Parameter.....: Solids, Total Dissolved (TDS)

Batch.....: 12846

Reporting Limit....: 10

Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
MB			0						09/04/96 1200
LCS		G960724A	486		500		97.2	% REC	09/04/96 1200
MD	962405-1		173			165	4.7	RPD	09/04/96 1200

Test Method.....: EPA 365.2

Method Description.: Phosphorous, All Forms

Parameter.....: Phosphorous, Total

Batch.....: 12859

Reporting Limit....: 0.01

Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		G960219A	0.33		0.323000		102.2	% REC	09/05/96 0900
LCS		G960219A	0.34		0.323000		105.3	% REC	09/05/96 0900
ICB			0.00						09/05/96 0900
DSC		G960702A	0.20		0.200000		100.0	% REC	09/05/96 0900
MB			0.00						09/05/96 0900
MD	961984-6		0.29			0.29	0.0	RPD	09/05/96 0900
MS	961984-6	G960702A	0.31		0.020000	0.29	100.0	% REC	09/05/96 0900
CCV		G960702A	0.40		0.400000		100.0	% REC	09/05/96 0900
CCB			0.00						09/05/96 0900
MD	962414-2		0.02			0.02	0.00	ABS Diff.	09/05/96 0900
MS	962414-2	G960702A	0.22		0.200000	0.02	100.0	% REC	09/05/96 0900
CCV		G960702A	0.39		0.400000		97.5	% REC	09/05/96 0900
CCB			0.00						09/05/96 0900
CCV		G960702A	0.39		0.400000		97.5	% REC	09/05/96 0900
CCB			0.00						09/05/96 0900

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Aluminum (Al)

Batch.....: 12875

Reporting Limit....: 0.02

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Y	1.95245		2.00		97.6	% REC	09/05/96 2114
ICB		960802Z	0.00175						09/05/96 2222
ISA		960323A	462.69555		500		92.5	% REC	09/05/96 2235
ISB		960630H	439.68774		500		87.9	% REC	09/05/96 2314
MD	962369-1		0.00739			-0.00091	0.00830	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	1.90469		2.0000	0.00579	94.9	% REC	09/05/96 2330
CCV		960618V	9.93482		10.0		99.3	% REC	09/06/96 0001
CCB		960802Z	0.00382						09/06/96 0008
ISA		960323A	464.99755		500		93.0	% REC	09/06/96 0039
ISB		960630H	446.72238		500		89.3	% REC	09/06/96 0041
CCV		960618V	9.69189		10.0		96.9	% REC	09/06/96 0058
CCB		960802Z	0.00265						09/06/96 0101
CCV		960618V	9.80440		10.0		98.0	% REC	09/06/96 0125
CCB		960802Z	0.00796						09/06/96 0126
CCV		960618V	9.62760		10.0		96.3	% REC	09/06/96 0151
CCB		960802Z	0.00234						09/06/96 0153
CCV		960618V	9.94566		10.0		99.5	% REC	09/06/96 0217
CCB		960802Z	-0.00392						09/06/96 021
CCV		960618V	10.05847		10.0		100.6	% REC	09/06/96 024



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 12875

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.02

Parameter.....: Aluminum (Al)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCB		960802Z	0.00532						09/06/96 0243
CCV		960618V	9.97686		10.0		99.8	% REC	09/06/96 0304
CCB		960802Z	0.00382						09/06/96 0306
ISA		960323A	464.92089		500		93.0	% REC	09/06/96 0315
ISB		960630H	444.51461		500		88.9	% REC	09/06/96 0318
CCV		960618V	9.48377		10.0		94.8	% REC	09/06/96 0350
CCB		960802Z	0.00526						09/06/96 0352
CCV		960618V	9.38851		10.0		93.9	% REC	09/06/96 0418
CCB		960802Z	0.00140						09/06/96 0421
CCV		960618V	9.60169		10.0		96.0	% REC	09/06/96 0449
CCB		960802Z	0.00823						09/06/96 0452
ISA		960323A	473.60754		500		94.7	% REC	09/06/96 0510
ISB		960630H	448.15478		500		89.6	% REC	09/06/96 0512
CCV		960618V	9.72720		10.0		97.3	% REC	09/06/96 0515
CCB		960802Z	0.01682						09/06/96 0517

Test Method.....: SW-846 6010A

Batch.....: 12875

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.01

Parameter.....: Barium (Ba)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618V	1.96964		2.00		98.5	% REC	09/05/96 2114
ICB		960802Z	-0.00037						09/05/96 2222
ISB		960630H	0.46826		0.5000		93.7	% REC	09/05/96 2314
MD	962369-1		0.03738			0.03730	0.00008	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.95774		1.000	0.01895	93.9	% REC	09/05/96 2330
CCV		960618V	5.02276		5.0		100.5	% REC	09/06/96 0001
CCB		960802Z	0.00059						09/06/96 0008
ISB		960630H	0.47842		0.5000		95.7	% REC	09/06/96 0041
CCV		960618V	4.87863		5.0		97.6	% REC	09/06/96 0058
CCB		960802Z	0.00000						09/06/96 0101
CCV		960618V	4.95474		5.0		99.1	% REC	09/06/96 0125
CCB		960802Z	0.00217						09/06/96 0126
CCV		960618V	4.81600		5.0		96.3	% REC	09/06/96 0151
CCB		960802Z	0.00112						09/06/96 0153
CCV		960618V	5.03624		5.0		100.7	% REC	09/06/96 0217
CCB		960802Z	0.00082						09/06/96 0218
CCV		960618V	5.12322		5.0		102.5	% REC	09/06/96 0241
CCB		960802Z	0.00187						09/06/96 0243
CCV		960618V	5.01445		5.0		100.3	% REC	09/06/96 0304
CCB		960802Z	0.00292						09/06/96 0306
ISB		960630H	0.47121		0.5000		94.2	% REC	09/06/96 0318
CCV		960618V	4.78020		5.0		95.6	% REC	09/06/96 0350
CCB		960802Z	0.00142						09/06/96 0352
CCV		960618V	4.71435		5.0		94.3	% REC	09/06/96 0418
CCB		960802Z	0.00157						09/06/96 0421
CCV		960618V	4.87713		5.0		97.5	% REC	09/06/96 0449
CCB		960802Z	0.00149						09/06/96 0452
ISB		960630H	0.48712		0.5000		97.4	% REC	09/06/96 0512
I		960618V	4.91728		5.0		98.3	% REC	09/06/96 0515
I		960802Z	0.00149						09/06/96 0517



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Boron (B)

Batch.....: 12875

Reporting Limit....: 0.05

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Y	1.90406		2.00		95.2	% REC	09/05/96 2114
ICB		960802Z	0.00242						09/05/96 2222
ISB		960630H	0.86496		1.000		86.5	% REC	09/05/96 2314
MD	962369-1		0.01944			0.00376	0.01568	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.92163		1.000	0.00981	91.2	% REC	09/05/96 2330
CCV		960618V	2.42256		2.5		96.9	% REC	09/06/96 0001
CCB		960802Z	0.00121						09/06/96 0008
ISB		960630H	0.80105		1.000		80.1	% REC	09/06/96 0041
CCV		960618V	2.41307		2.5		96.5	% REC	09/06/96 0058
CCB		960802Z	0.01596						09/06/96 0101
CCV		960618V	2.43915		2.5		97.6	% REC	09/06/96 0125
CCB		960802Z	0.00125						09/06/96 0126
CCV		960618V	2.35210		2.5		94.1	% REC	09/06/96 0151
CCB		960802Z	0.00003						09/06/96 0153
CCV		960618V	2.46941		2.5		98.8	% REC	09/06/96 0217
CCB		960802Z	0.00126						09/06/96 0218
CCV		960618V	2.49971		2.5		100.0	% REC	09/06/96 0241
CCB		960802Z	0.00252						09/06/96 0243
CCV		960618V	2.45368		2.5		98.1	% REC	09/06/96 0304
CCB		960802Z	0.00005						09/06/96 0306
ISB		960630H	0.95767		1.000		95.8	% REC	09/06/96 0318
CCV		960618V	2.36085		2.5		94.4	% REC	09/06/96 0350
CCB		960802Z	0.00987						09/06/96 0352
CCV		960618V	2.34895		2.5		94.0	% REC	09/06/96 0418
CCB		960802Z	-0.00362						09/06/96 0421
CCV		960618V	2.36976		2.5		94.8	% REC	09/06/96 0449
CCB		960802Z	0.00741						09/06/96 0452
ISB		960630H	0.87647		1.000		87.6	% REC	09/06/96 0512
CCV		960618V	2.40304		2.5		96.1	% REC	09/06/96 0515
CCB		960802Z	-0.00112						09/06/96 0517

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Cadmium (Cd)

Batch.....: 12875

Reporting Limit....: 0.005

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Z	1.99602		2.00		99.8	% REC	09/05/96 2110
ICB		960802Z	-0.00059						09/05/96 2222
ISB		960630H	0.93554		1.000		93.6	% REC	09/05/96 2314
MD	962369-1		0.00059			-0.00118	0.00177	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.98494		1.000	0.00055	98.4	% REC	09/05/96 2330
CCV		960618V	2.54827		2.5		101.9	% REC	09/06/96 0001
CCB		960802Z	-0.00001						09/06/96 0008
ISB		960630H	0.94863		1.000		94.9	% REC	09/06/96 0041
CCV		960618V	2.56516		2.5		102.6	% REC	09/06/96 0058
CCB		960802Z	-0.00002						09/06/96 0101
CCV		960618V	2.57345		2.5		102.9	% REC	09/06/96 0125
CCB		960802Z	0.00116						09/06/96 0126
CCV		960618V	2.51502		2.5		100.6	% REC	09/06/96 0151
CCB		960802Z	-0.00001						09/06/96 0153
CCV		960618V	2.47883		2.5		99.2	% REC	09/06/96 0217



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Cadmium (Cd)

Batch.....: 12875
Reporting Limit...: 0.005
Units.....: mg/L

Analyst...: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCB		960802Z	0.00236						09/06/96 0218
CCV		960618V	2.51394		2.5		100.6	% REC	09/06/96 0241
CCB		960802Z	0.00059						09/06/96 0243
CCV		960618V	2.53876		2.5		101.6	% REC	09/06/96 0304
CCB		960802Z	-0.00002						09/06/96 0306
ISB		960630H	0.94891		1.000		94.9	% REC	09/06/96 0318
CCV		960618V	2.51257		2.5		100.5	% REC	09/06/96 0350
CCB		960802Z	-0.00062						09/06/96 0352
CCV		960618V	2.46841		2.5		98.7	% REC	09/06/96 0418
CCB		960802Z	-0.00063						09/06/96 0421
CCV		960618V	2.48905		2.5		99.6	% REC	09/06/96 0449
CCB		960802Z	0.00057						09/06/96 0452
ISB		960630H	0.93966		1.000		94.0	% REC	09/06/96 0512
CCV		960618V	2.47408		2.5		99.0	% REC	09/06/96 0515
CCB		960802Z	-0.00002						09/06/96 0517

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Calcium (Ca)

Batch.....: 12875
Reporting Limit...: 0.1
Units.....: mg/L

Analyst...: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960410Z	19.00335		20.000000		95.0	% REC	09/05/96 2205
ICB		960802Z	-0.00595						09/05/96 2222
CCV		960618V	10.44039		10.0		104.4	% REC	09/06/96 0001
CCB		960802Z	0.00202						09/06/96 0008
CCV		960618V	9.92975		10.0		99.3	% REC	09/06/96 0058
CCB		960802Z	-0.00283						09/06/96 0101
CCV		960618V	10.18941		10.0		101.9	% REC	09/06/96 0125
CCB		960802Z	0.02308						09/06/96 0126
CCV		960618V	9.88779		10.0		98.9	% REC	09/06/96 0151
CCB		960802Z	0.00962						09/06/96 0153
CCV		960618V	10.32151		10.0		103.2	% REC	09/06/96 0217
CCB		960802Z	0.01939						09/06/96 0218
CCV		960618V	10.43668		10.0		104.4	% REC	09/06/96 0241
CCB		960802Z	0.01169						09/06/96 0243
CCV		960618V	10.28125		10.0		102.8	% REC	09/06/96 0304
CCB		960802Z	0.01437						09/06/96 0306
CCV		960618V	9.64912		10.0		96.5	% REC	09/06/96 0350
CCB		960802Z	0.00177						09/06/96 0352
CCV		960618V	9.60856		10.0		96.1	% REC	09/06/96 0418
CCB		960802Z	0.01045						09/06/96 0421
CCV		960618V	9.88139		10.0		98.8	% REC	09/06/96 0449
CCB		960802Z	0.00734						09/06/96 0452
CCV		960618V	10.14066		10.0		101.4	% REC	09/06/96 0515
CCB		960802Z	0.02657						09/06/96 0517



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Calcium (Ca)

Batch.....: 12875
Reporting Limit...: 1
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960410Z	190.91627		200.0		95.5	% REC	09/05/96 2153
ICB		960802Z	0.79812						09/05/96 2222
ISA		960323A	494.30123		500		98.9	% REC	09/05/96 2235
ISB		960630H	478.47296		500		95.7	% REC	09/05/96 2314
MD	962369-1		47.31321			47.19387	0.3	RPD	09/05/96 2326
PDS	962369-2	960630G	188.42492		50	149.63003	77.6	% REC	09/05/96 2330
CCV		960618U	260.09228		250.00		104.0	% REC	09/05/96 2359
CCB		960802Z	0.05080						09/06/96 0008
ISA		960323A	484.23550		500		96.8	% REC	09/06/96 0039
ISB		960630H	472.66610		500		94.5	% REC	09/06/96 0041
CCV		960618U	248.13104		250.00		99.3	% REC	09/06/96 0049
CCB		960802Z	0.75483						09/06/96 0101
CCV		960618U	266.87133		250.00		106.7	% REC	09/06/96 0123
CCB		960802Z	0.52257						09/06/96 0126
CCV		960618U	269.43341		250.00		107.8	% REC	09/06/96 0149
CCB		960802Z	0.50080						09/06/96 0153
CCV		960618U	269.23016		250.00		107.7	% REC	09/06/96 0215
CCB		960802Z	-0.71854						09/06/96 0218
CCV		960618U	274.94952		250.00		110.0	% REC	09/06/96 0239
CCB		960802Z	-0.94354						09/06/96 0243
CCV		960618U	273.29467		250.00		109.3	% REC	09/06/96 0302
CCB		960802Z	-0.42822						09/06/96 0306
ISA		960323A	482.89273		500		96.6	% REC	09/06/96 0315
ISB		960630H	468.98632		500		93.8	% REC	09/06/96 0318
CCV		960618U	262.21893		250.00		104.9	% REC	09/06/96 0321
CCB		960802Z	0.82741						09/06/96 0352
CCB		960802Z	0.53709						09/06/96 0421
CCB		960802Z	0.31209						09/06/96 0452
ISA		960323A	492.11047		500		98.4	% REC	09/06/96 0510
ISB		960630H	473.66052		500		94.7	% REC	09/06/96 0512
CCB		960802Z	-0.60241						09/06/96 0517

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Chromium (Cr)

Batch.....: 12875
Reporting Limit...: 0.01
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Z	1.90478		2.00		95.2	% REC	09/05/96 2110
ICB		960802Z	-0.00189						09/05/96 2222
ISB		960630H	0.41015		0.5000		82.0	% REC	09/05/96 2314
MD	962369-1		-0.00057			-0.00134	0.00077	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.88893		1.000	-0.00048	88.9	% REC	09/05/96 2330
CCV		960618V	2.39727		2.5		95.9	% REC	09/06/96 0001
CCB		960802Z	-0.00379						09/06/96 0008
ISB		960630H	0.41640		0.5000		83.3	% REC	09/06/96 0041
CCV		960618V	2.38506		2.5		95.4	% REC	09/06/96 0058
CCB		960802Z	0.00152						09/06/96 0101
CCV		960618V	2.40183		2.5		96.1	% REC	09/06/96 0125
CCB		960802Z	0.00038						09/06/96 0126
CCV		960618V	2.35150		2.5		94.1	% REC	09/06/96 0157
CCB		960802Z	-0.00113						09/06/96 0157



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Chromium (Cr)

Batch.....: 12875

Reporting Limit....: 0.01

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960618V	2.36976		2.5		94.8	% REC	09/06/96 0217
CCB		960802Z	-0.00229						09/06/96 0218
CCV		960618V	2.40026		2.5		96.0	% REC	09/06/96 0241
CCB		960802Z	-0.00153						09/06/96 0243
CCV		960618V	2.38770		2.5		95.5	% REC	09/06/96 0304
CCB		960802Z	-0.00038						09/06/96 0306
ISB		960630H	0.41147		0.5000		82.3	% REC	09/06/96 0318
CCV		960618V	2.33896		2.5		93.6	% REC	09/06/96 0350
CCB		960802Z	-0.00037						09/06/96 0352
CCV		960618V	2.29396		2.5		91.8	% REC	09/06/96 0418
CCB		960802Z	-0.00151						09/06/96 0421
CCV		960618V	2.33665		2.5		93.5	% REC	09/06/96 0449
CCB		960802Z	-0.00075						09/06/96 0452
ISB		960630H	0.41275		0.5000		82.5	% REC	09/06/96 0512
CCV		960618V	2.33207		2.5		93.3	% REC	09/06/96 0515
CCB		960802Z	-0.00190						09/06/96 0517

st Method.....: SW-846 6010A

thod Description.: Metals Analysis (ICAP)

Parameter.....: Cobalt (Co)

Batch.....: 12875

Reporting Limit....: 0.03

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Z	1.99664		2.00		99.8	% REC	09/05/96 2110
ICB		960802Z	-0.00097						09/05/96 2222
ISB		960630H	0.44906		0.5000		89.8	% REC	09/05/96 2314
MD	962369-1		-0.00165			-0.00165	0.00000	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.93658		1.000	-0.00165	93.8	% REC	09/05/96 2330
CCV		960618V	2.52321		2.5		100.9	% REC	09/06/96 0001
CCB		960802Z	-0.00162						09/06/96 0008
ISB		960630H	0.45905		0.5000		91.8	% REC	09/06/96 0041
CCV		960618V	2.49767		2.5		99.9	% REC	09/06/96 0058
CCB		960802Z	-0.00163						09/06/96 0101
CCV		960618V	2.51385		2.5		100.6	% REC	09/06/96 0125
CCB		960802Z	0.00063						09/06/96 0126
CCV		960618V	2.46398		2.5		98.6	% REC	09/06/96 0151
CCB		960802Z	-0.00033						09/06/96 0153
CCV		960618V	2.47670		2.5		99.1	% REC	09/06/96 0217
CCB		960802Z	-0.00358						09/06/96 0218
CCV		960618V	2.51918		2.5		100.8	% REC	09/06/96 0241
CCB		960802Z	0.00032						09/06/96 0243
CCV		960618V	2.49625		2.5		99.8	% REC	09/06/96 0304
CCB		960802Z	0.00064						09/06/96 0306
ISB		960630H	0.45064		0.5000		90.1	% REC	09/06/96 0318
CCV		960618V	2.44258		2.5		97.7	% REC	09/06/96 0350
CCB		960802Z	-0.00065						09/06/96 0352
CCV		960618V	2.39783		2.5		95.9	% REC	09/06/96 0418
CCB		960802Z	-0.00163						09/06/96 0421
CCV		960618V	2.44834		2.5		97.9	% REC	09/06/96 0449
CCB		960802Z	-0.00065						09/06/96 0452
		960630H	0.45319		0.5000		90.6	% REC	09/06/96 0512
		960618V	2.43690		2.5		97.5	% REC	09/06/96 0515



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Cobalt (Co)

Batch.....: 12875
Reporting Limit....: 0.03
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCB		960802Z	-0.00065						09/06/96 0517

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Copper (Cu)

Batch.....: 12875
Reporting Limit....: 0.01
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Z	2.02254		2.00		101.1	% REC	09/05/96 2110
ICB		960802Z	0.00228						09/05/96 2222
ISB		960630H	0.42153		0.5000		84.3	% REC	09/05/96 2314
MD 962369-1			0.00942			0.01020	0.00078	ABS Diff.	09/05/96 2326
PDS 962369-2		960630G	0.94692		1.000	-0.00599	95.3	% REC	09/05/96 2330
CCV		960618V	2.54635		2.5		101.9	% REC	09/06/96 0001
CCB		960802Z	0.00193						09/06/96 0008
ISB		960630H	0.43462		0.5000		86.9	% REC	09/06/96 0041
CCV		960618V	2.49505		2.5		99.8	% REC	09/06/96 0058
CCB		960802Z	0.00306						09/06/96 0101
CCV		960618V	2.52573		2.5		101.0	% REC	09/06/96 0125
CCB		960802Z	0.00345						09/06/96 0126
CCV		960618V	2.46166		2.5		98.5	% REC	09/06/96 0151
CCB		960802Z	0.00346						09/06/96 0153
CCV		960618V	2.54790		2.5		101.9	% REC	09/06/96 0217
CCB		960802Z	0.00353						09/06/96 0218
CCV		960618V	2.58364		2.5		103.3	% REC	09/06/96 0241
CCB		960802Z	0.00354						09/06/96 0243
CCV		960618V	2.55137		2.5		102.1	% REC	09/06/96 0304
CCB		960802Z	0.00390						09/06/96 0306
ISB		960630H	0.43139		0.5000		86.3	% REC	09/06/96 0318
CCV		960618V	2.46175		2.5		98.5	% REC	09/06/96 0350
CCB		960802Z	0.00188						09/06/96 0352
CCV		960618V	2.42836		2.5		97.1	% REC	09/06/96 0418
CCB		960802Z	0.00268						09/06/96 0421
CCV		960618V	2.49130		2.5		99.7	% REC	09/06/96 0449
CCB		960802Z	0.00463						09/06/96 0452
ISB		960630H	0.44100		0.5000		88.2	% REC	09/06/96 0512
CCV		960618V	2.50954		2.5		100.4	% REC	09/06/96 0515
CCB		960802Z	0.00391						09/06/96 0517

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Iron (Fe)

Batch.....: 12875
Reporting Limit....: 0.03
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Z	1.95418		2.00		97.7	% REC	09/05/96 2110
ICB		960802Z	0.00037						09/05/96 2222
ISA		960323A	161.48588		200		80.7	% REC	09/05/96 2235
ISB		960630H	175.74902		200		87.9	% REC	09/05/96 2314
MD 962369-1			0.02291			0.03170	0.00879	ABS Diff.	09/05/96 2326
PDS 962369-2		960630G	2.09488		2.0000	0.02857	103.3	% REC	09/05/96 2330



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Iron (Fe)

Batch.....: 12875

Reporting Limit....: 0.03

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960618V	9.87858		10.0		98.8	% REC	09/06/96 0001
CCB		960802Z	0.00114						09/06/96 0008
ISA		960323A	167.22517		200		83.6	% REC	09/06/96 0039
ISB		960630H	161.62844		200		80.8	% REC	09/06/96 0041
CCV		960618V	9.83018		10.0		98.3	% REC	09/06/96 0058
CCB		960802Z	0.00113						09/06/96 0101
MD	962417-1		0.26052			0.27002	3.6	RPD	09/06/96 0105
PDS	962417-2	960630G	2.68107		2.0000	0.77864	95.1	% REC	09/06/96 0108
CCV		960618V	9.90778		10.0		99.1	% REC	09/06/96 0125
CCB		960802Z	0.00684						09/06/96 0126
CCV		960618V	9.61877		10.0		96.2	% REC	09/06/96 0151
CCB		960802Z	0.00798						09/06/96 0153
CCV		960618V	9.78275		10.0		97.8	% REC	09/06/96 0217
CCB		960802Z	0.00684						09/06/96 0218
CCV		960618V	10.00669		10.0		100.1	% REC	09/06/96 0241
CCB		960802Z	0.01559						09/06/96 0243
CCV		960618V	9.84623		10.0		98.5	% REC	09/06/96 0304
		960802Z	0.01178						09/06/96 0306
		960323A	171.48059		200		85.7	% REC	09/06/96 0315
		960630H	204.56307		200		102.3	% REC	09/06/96 0318
CCV		960618V	10.82354		10.0		108.2	% REC	09/06/96 0350
CCB		960802Z	0.01112						09/06/96 0352
MD	960850-89		0.00555			0.00640	0.00085	ABS Diff.	09/06/96 0358
PDS	960850-90	960630G	2.28291		2.0000	0.00940	113.7	% REC	09/06/96 0403
CCV		960618V	10.59792		10.0		106.0	% REC	09/06/96 0418
CCB		960802Z	0.01069						09/06/96 0421
CCV		960618V	10.90403		10.0		109.0	% REC	09/06/96 0449
CCB		960802Z	0.00984						09/06/96 0452
MD	962115-54		0.00256			0.00341	0.00085	ABS Diff.	09/06/96 0502
PDS	962115-55	960630G	3.94796		2.0000	1.66198	114.3	% REC	09/06/96 0507
ISA		960323A	191.09173		200		95.5	% REC	09/06/96 0510
ISB		960630H	180.67959		200		90.3	% REC	09/06/96 0512
CCV		960618V	10.92544		10.0		109.3	% REC	09/06/96 0515
CCB		960802Z	0.02267						09/06/96 0517

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Lithium (Li)

Batch.....: 12875

Reporting Limit....: 0.01

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960829Z	1.99349		2.000000		99.7	% REC	09/05/96 2217
ICB		960802Z	0.00193						09/05/96 2222
ISB		960630H	0.99266		1.000		99.3	% REC	09/05/96 2314
MD	962369-1		0.01037			0.00804	0.00233	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.96338		1.000	0.00720	95.6	% REC	09/05/96 2330
CCV		960618U	2.31116		2.500		92.4	% REC	09/05/96 2359
CCV		960618V	2.45197		2.5		98.1	% REC	09/06/96 0001
CCB		960802Z	0.00038						09/06/96 0008
ISB		960630H	1.01033		1.000		101.0	% REC	09/06/96 0041
		960618U	2.37450		2.500		95.0	% REC	09/06/96 0049
		960618V	2.49380		2.5		99.8	% REC	09/06/96 0058



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Lithium (Li)

Batch.....: 12875
Reporting Limit...: 0.01
Units.....: mg/L

Analyst...: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCB		960802Z	0.00452						09/06/96 0101
CCV		960618U	2.45296		2.500		98.1	% REC	09/06/96 0123
CCV		960618V	2.54680		2.5		101.9	% REC	09/06/96 0125
CCB		960802Z	0.00451						09/06/96 0126
CCV		960618U	2.45994		2.500		98.4	% REC	09/06/96 0149
CCV		960618V	2.47983		2.5		99.2	% REC	09/06/96 0151
CCB		960802Z	0.00369						09/06/96 0153
CCV		960618U	2.48089		2.500		99.2	% REC	09/06/96 0215
CCV		960618V	2.66306		2.5		106.5	% REC	09/06/96 0217
CCB		960802Z	0.00123						09/06/96 0218
CCV		960618U	2.60907		2.500		104.4	% REC	09/06/96 0239
CCV		960618V	2.70579		2.5		108.2	% REC	09/06/96 0241
CCB		960802Z	-0.00246						09/06/96 0243
CCV		960618U	2.54293		2.500		101.7	% REC	09/06/96 0302
CCV		960618V	2.63390		2.5		105.4	% REC	09/06/96 0304
CCB		960802Z	-0.00082						09/06/96 0306
ISB		960630H	1.06652		1.000		106.7	% REC	09/06/96 0318
CCV		960618U	2.40284		2.500		96.1	% REC	09/06/96 0321
CCV		960618V	2.44654		2.5		97.9	% REC	09/06/96 0350
CCB		960802Z	0.00616						09/06/96 0352
CCV		960618V	2.42558		2.5		97.0	% REC	09/06/96 0418
CCB		960802Z	0.00698						09/06/96 0421
CCV		960618V	2.52008		2.5		100.8	% REC	09/06/96 0449
CCB		960802Z	0.00575						09/06/96 0452
ISB		960630H	1.09019		1.000		109.0	% REC	09/06/96 0512
CCV		960618V	2.57923		2.5		103.2	% REC	09/06/96 0515
CCB		960802Z	0.00123						09/06/96 0517

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Magnesium (Mg)

Batch.....: 12875
Reporting Limit...: 0.1
Units.....: mg/L

Analyst...: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960410Z	19.59754		20.000000		98.0	% REC	09/05/96 2205
ICB		960802Z	-0.00583						09/05/96 2222
MD	962369-1		36.55355			36.42992	0.3	RPD	09/05/96 2326
CCV		960618V	26.07762		25.0		104.3	% REC	09/06/96 0001
CCB		960802Z	0.00874						09/06/96 0008
CCV		960618V	25.79273		25.0		103.2	% REC	09/06/96 0058
CCB		960802Z	0.00058						09/06/96 0101
CCV		960618V	25.97834		25.0		103.9	% REC	09/06/96 0125
CCB		960802Z	0.02726						09/06/96 0126
CCV		960618V	25.42431		25.0		101.7	% REC	09/06/96 0151
CCB		960802Z	0.01676						09/06/96 0153
CCV		960618V	25.68878		25.0		102.8	% REC	09/06/96 0217
CCB		960802Z	0.02565						09/06/96 0218
CCV		960618V	26.07746		25.0		104.3	% REC	09/06/96 0241
CCB		960802Z	0.01953						09/06/96 0243
CCV		960618V	25.86490		25.0		103.5	% REC	09/06/96 0304
CCB		960802Z	0.02580						09/06/96 0306
CCV		960618V	25.29119		25.0		101.2	% REC	09/06/96 0350



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 12875

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.1

Parameter.....: Magnesium (Mg)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCB		960802Z	0.00364						09/06/96 0352
CCV		960618V	24.87275		25.0		99.5	% REC	09/06/96 0418
CCB		960802Z	0.00335						09/06/96 0421
CCV		960618V	25.40855		25.0		101.6	% REC	09/06/96 0449
CCB		960802Z	0.00510						09/06/96 0452
CCV		960618V	25.30489		25.0		101.2	% REC	09/06/96 0515
CCB		960802Z	0.02682						09/06/96 0517

Test Method.....: SW-846 6010A

Batch.....: 12875

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.5

Parameter.....: Magnesium (Mg)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960410Z	194.49443		200.0		97.2	% REC	09/05/96 2153
ICB		960802Z	0.02190						09/05/96 2222
		960323A	519.81140		500		104.0	% REC	09/05/96 2235
		960630H	497.29510		500		99.5	% REC	09/05/96 2314
	962369-1		38.73934			38.57697	0.4	RPD	09/05/96 2326
PDS	962369-2	960630G	80.46647		50	31.85012	97.2	% REC	09/05/96 2330
CCV		960618U	251.61599		250.00		100.6	% REC	09/05/96 2359
CCB		960802Z	-0.03092						09/06/96 0008
ISA		960323A	522.26953		500		104.5	% REC	09/06/96 0039
ISB		960630H	501.49871		500		100.3	% REC	09/06/96 0041
CCV		960618U	239.30084		250.00		95.7	% REC	09/06/96 0049
CCB		960802Z	0.02255						09/06/96 0101
CCV		960618U	256.21591		250.00		102.5	% REC	09/06/96 0123
CCB		960802Z	0.03286						09/06/96 0126
CCV		960618U	258.84930		250.00		103.5	% REC	09/06/96 0149
CCB		960802Z	0.01675						09/06/96 0153
CCV		960618U	258.85574		250.00		103.5	% REC	09/06/96 0215
CCB		960802Z	-0.08891						09/06/96 0218
CCV		960618U	263.13864		250.00		105.3	% REC	09/06/96 0239
CCB		960802Z	-0.10953						09/06/96 0243
CCV		960618U	261.81903		250.00		104.7	% REC	09/06/96 0302
CCB		960802Z	-0.04574						09/06/96 0306
ISA		960323A	521.62713		500		104.3	% REC	09/06/96 0315
ISB		960630H	499.29641		500		99.9	% REC	09/06/96 0318
CCV		960618U	251.88726		250.00		100.8	% REC	09/06/96 0321
CCB		960802Z	0.02835						09/06/96 0352
CCB		960802Z	0.00257						09/06/96 0421
CCB		960802Z	0.00257						09/06/96 0452
ISA		960323A	528.54022		500		105.7	% REC	09/06/96 0510
ISB		960630H	501.94525		500		100.4	% REC	09/06/96 0512
CCB		960802Z	-0.07409						09/06/96 0517



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Manganese (Mn)

Batch.....: 12875
Reporting Limit...: 0.01
Units.....: mg/L

Analyst...: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Z	2.01161		2.00		100.6	% REC	09/05/96 2110
ICB		960802Z	-0.00073						09/05/96 2222
ISB		960630H	0.43740		0.5000		87.5	% REC	09/05/96 2314
MD	962369-1		3.43617			3.41865	0.5	RPD	09/05/96 2326
PDS	962369-2	960630G	2.22455		1.000	1.39497	83.0	% REC	09/05/96 2330
CCV		960618V	5.07204		5.0		101.4	% REC	09/06/96 0001
CCB		960802Z	0.00049						09/06/96 0008
ISB		960630H	0.43800		0.5000		87.6	% REC	09/06/96 0041
CCV		960618V	5.01522		5.0		100.3	% REC	09/06/96 0058
CCB		960802Z	0.00074						09/06/96 0101
CCV		960618V	5.06142		5.0		101.2	% REC	09/06/96 0125
CCB		960802Z	0.00198						09/06/96 0126
CCV		960618V	4.94431		5.0		98.9	% REC	09/06/96 0151
CCB		960802Z	0.00123						09/06/96 0153
CCV		960618V	4.98464		5.0		99.7	% REC	09/06/96 0217
CCB		960802Z	0.00098						09/06/96 0218
CCV		960618V	5.05630		5.0		101.1	% REC	09/06/96 0241
CCB		960802Z	0.00123						09/06/96 0243
CCV		960618V	5.01379		5.0		100.3	% REC	09/06/96 0304
CCB		960802Z	0.00271						09/06/96 0306
ISB		960630H	0.44451		0.5000		88.9	% REC	09/06/96 0318
CCV		960618V	4.90752		5.0		98.2	% REC	09/06/96 0350
CCB		960802Z	0.00074						09/06/96 0352
CCV		960618V	4.81908		5.0		96.4	% REC	09/06/96 0418
CCB		960802Z	0.00074						09/06/96 0421
CCV		960618V	4.91473		5.0		98.3	% REC	09/06/96 0449
CCB		960802Z	0.00173						09/06/96 0452
ISB		960630H	0.44100		0.5000		88.2	% REC	09/06/96 0512
CCV		960618V	4.90142		5.0		98.0	% REC	09/06/96 0515
CCB		960802Z	0.00148						09/06/96 0517

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Molybdenum (Mo)

Batch.....: 12875
Reporting Limit...: 0.05
Units.....: mg/L

Analyst...: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Z	1.93966		2.00		97.0	% REC	09/05/96 2110
ICB		960802Z	0.00078						09/05/96 2222
ISB		960630H	0.88563		1.000		88.6	% REC	09/05/96 2314
MD	962369-1		-0.00016			0.00220	0.00236	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.94470		1.000	0.02044	92.4	% REC	09/05/96 2330
CCV		960618V	2.48699		2.5		99.5	% REC	09/06/96 0001
CCB		960802Z	-0.00078						09/06/96 0008
ISB		960630H	0.90086		1.000		90.1	% REC	09/06/96 0041
CCV		960618V	2.49567		2.5		99.8	% REC	09/06/96 0058
CCB		960802Z	-0.00157						09/06/96 0101
CCV		960618V	2.52091		2.5		100.8	% REC	09/06/96 0125
CCB		960802Z	0.00631						09/06/96 0126
CCV		960618V	2.44119		2.5		97.6	% REC	09/06/96 0151
CCB		960802Z	0.00158						09/06/96 0153
CCV		960618V	2.47434		2.5		99.0	% REC	09/06/96 0211



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Molybdenum (Mo)

Batch.....: 12875
Reporting Limit...: 0.05
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCB		960802Z	0.00000						09/06/96 0218
CCV		960618V	2.52408		2.5		101.0	% REC	09/06/96 0241
CCB		960802Z	0.00158						09/06/96 0243
CCV		960618V	2.50038		2.5		100.0	% REC	09/06/96 0304
CCB		960802Z	0.00552						09/06/96 0306
ISB		960630H	0.90115		1.000		90.1	% REC	09/06/96 0318
CCV		960618V	2.46671		2.5		98.7	% REC	09/06/96 0350
CCB		960802Z	0.00710						09/06/96 0352
CCV		960618V	2.40592		2.5		96.2	% REC	09/06/96 0418
CCB		960802Z	0.00552						09/06/96 0421
CCV		960618V	2.46988		2.5		98.8	% REC	09/06/96 0449
CCB		960802Z	0.00709						09/06/96 0452
ISB		960630H	0.90781		1.000		90.8	% REC	09/06/96 0512
CCV		960618V	2.47382		2.5		99.0	% REC	09/06/96 0515
CCB		960802Z	0.00789						09/06/96 0517

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Nickel (Ni)

Batch.....: 12875
Reporting Limit...: 0.04
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Z	1.97701		2.00		98.9	% REC	09/05/96 2110
ICB		960802Z	0.00112						09/05/96 2222
ISB		960630H	0.84213		1.000		84.2	% REC	09/05/96 2314
MD	962369-1		0.00009			0.00438	0.00429	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.91355		1.000	-0.00026	91.4	% REC	09/05/96 2330
CCV		960618V	2.45606		2.5		98.2	% REC	09/06/96 0001
CCB		960802Z	-0.00107						09/06/96 0008
ISB		960630H	0.87620		1.000		87.6	% REC	09/06/96 0041
CCV		960618V	2.45257		2.5		98.1	% REC	09/06/96 0058
CCB		960802Z	0.00631						09/06/96 0101
CCV		960618V	2.45109		2.5		98.0	% REC	09/06/96 0125
CCB		960802Z	0.00849						09/06/96 0126
CCV		960618V	2.41963		2.5		96.8	% REC	09/06/96 0151
CCB		960802Z	0.00306						09/06/96 0153
CCV		960618V	2.43740		2.5		97.5	% REC	09/06/96 0217
CCB		960802Z	0.00328						09/06/96 0218
CCV		960618V	2.46234		2.5		98.5	% REC	09/06/96 0241
CCB		960802Z	-0.00128						09/06/96 0243
CCV		960618V	2.42374		2.5		96.9	% REC	09/06/96 0304
CCB		960802Z	0.00479						09/06/96 0306
ISB		960630H	0.85631		1.000		85.6	% REC	09/06/96 0318
CCV		960618V	2.37344		2.5		94.9	% REC	09/06/96 0350
CCB		960802Z	0.00179						09/06/96 0352
CCV		960618V	2.34782		2.5		93.9	% REC	09/06/96 0418
CCB		960802Z	0.00023						09/06/96 0421
CCV		960618V	2.37340		2.5		94.9	% REC	09/06/96 0449
CCB		960802Z	-0.00281						09/06/96 0452
ISB		960630H	0.86612		1.000		86.6	% REC	09/06/96 0512
/		960618V	2.37019		2.5		94.8	% REC	09/06/96 0515
}		960802Z	0.00000						09/06/96 0517



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Potassium (K)

Batch.....: 12875
Reporting Limit....: 5
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960410Z	97.85466		100.0		97.9	% REC	09/05/96 2153
ICB		960802Z	1.53834						09/05/96 2222
ISB		960630H	11.22224		10.000		112.2	% REC	09/05/96 2314
MD	962369-1		16.97650			17.16424	0.18774	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	102.22091		50.000	53.61873	97.2	% REC	09/05/96 2330
CCV		960618U	253.71801		250.00		101.5	% REC	09/05/96 2359
CCB		960802Z	0.61917						09/06/96 0008
ISB		960630H	10.13091		10.000		101.3	% REC	09/06/96 0041
CCV		960618U	239.66720		250.00		95.9	% REC	09/06/96 0049
CCB		960802Z	1.51679						09/06/96 0101
CCV		960618U	258.93359		250.00		103.6	% REC	09/06/96 0123
CCB		960802Z	0.99286						09/06/96 0126
CCV		960618U	260.41796		250.00		104.2	% REC	09/06/96 0149
CCB		960802Z	1.44592						09/06/96 0153
CCV		960618U	260.86553		250.00		104.3	% REC	09/06/96 0215
CCB		960802Z	-0.79518						09/06/96 0218
CCV		960618U	266.41616		250.00		106.6	% REC	09/06/96 0239
CCB		960802Z	-1.15334						09/06/96 0243
CCV		960618U	264.59857		250.00		105.8	% REC	09/06/96 0302
CCB		960802Z	-0.37358						09/06/96 0306
ISB		960630H	10.80148		10.000		108.0	% REC	09/06/96 0318
CCV		960618U	255.49423		250.00		102.2	% REC	09/06/96 0321
CCB		960802Z	1.91071						09/06/96 0352
CCB		960802Z	1.66152						09/06/96 0421
CCB		960802Z	1.06578						09/06/96 0452
ISB		960630H	9.18392		10.000		91.8	% REC	09/06/96 0512
CCB		960802Z	-0.67464						09/06/96 0517

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Silver (Ag)

Batch.....: 12875
Reporting Limit....: 0.01
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Y	2.09090		2.00		104.5	% REC	09/05/96 2114
ICB		960802Z	0.00342						09/05/96 2222
ISB		960630H	0.91271		1.000		91.3	% REC	09/05/96 2314
MD	962369-1		-0.00080			-0.00017	0.00063	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.97694		1.000	0.00078	97.6	% REC	09/05/96 2330
CCV		960618U	2.39820		2.5		95.9	% REC	09/05/96 2359
CCB		960802Z	0.00124						09/06/96 0008
ISB		960630H	0.88292		1.000		88.3	% REC	09/06/96 0041
CCV		960618U	2.39022		2.5		95.6	% REC	09/06/96 0049
CCB		960802Z	0.00066						09/06/96 0101
CCV		960618U	2.67702		2.5		107.1	% REC	09/06/96 0123
CCB		960802Z	0.00230						09/06/96 0126
CCV		960618U	2.68294		2.5		107.3	% REC	09/06/96 0149
CCB		960802Z	0.00164						09/06/96 0153
CCV		960618U	2.66686		2.5		106.7	% REC	09/06/96 0215
CCB		960802Z	0.00098						09/06/96 0218
CCV		960618U	2.69318		2.5		107.7	% REC	09/06/96 0231
CCB		960802Z	0.00229						09/06/96 0243



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Silver (Ag)

Batch.....: 12875

Reporting Limit....: 0.01

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960618U	2.68626		2.5		107.5	% REC	09/06/96 0302
CCB		960802Z	0.00197						09/06/96 0306
ISB		960630H	0.84744		1.000		84.7	% REC	09/06/96 0318
CCV		960618U	2.65467		2.5		106.2	% REC	09/06/96 0321
CCB		960802Z	0.00001						09/06/96 0352
CCB		960802Z	-0.00130						09/06/96 0421
CCB		960802Z	-0.00065						09/06/96 0452
ISB		960630H	0.91056		1.000		91.1	% REC	09/06/96 0512
CCB		960802Z	-0.00196						09/06/96 0517

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Sodium (Na)

Batch.....: 12875

Reporting Limit....: 1

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
/		960410Z	19.17126		20.000000		95.9	% REC	09/05/96 2205
3		960802Z	-0.00331						09/05/96 2222
	962369-1		26.89321			26.82805	0.2	RPD	09/05/96 2326
PDS	962369-2	960630G	62.90435		50.000	13.50900	98.8	% REC	09/05/96 2330
CCV		960618V	51.02543		50.0		102.1	% REC	09/06/96 0001
CCB		960802Z	0.00000						09/06/96 0008
CCV		960618V	50.07012		50.0		100.1	% REC	09/06/96 0058
CCB		960802Z	0.00993						09/06/96 0101
CCV		960618V	50.61680		50.0		101.2	% REC	09/06/96 0125
CCB		960802Z	0.05853						09/06/96 0126
CCV		960618V	49.28821		50.0		98.6	% REC	09/06/96 0151
CCB		960802Z	0.03202						09/06/96 0153
CCV		960618V	51.63948		50.0		103.3	% REC	09/06/96 0217
CCB		960802Z	0.03313						09/06/96 0218
CCV		960618V	52.74277		50.0		105.5	% REC	09/06/96 0241
CCB		960802Z	0.02429						09/06/96 0243
CCV		960618V	51.62733		50.0		103.3	% REC	09/06/96 0304
CCB		960802Z	0.04638						09/06/96 0306
CCV		960618V	48.97014		50.0		97.9	% REC	09/06/96 0350
CCB		960802Z	0.02319						09/06/96 0352
CCV		960618V	48.35499		50.0		96.7	% REC	09/06/96 0418
CCB		960802Z	-0.00331						09/06/96 0421
CCV		960618V	50.13860		50.0		100.3	% REC	09/06/96 0449
CCB		960802Z	-0.00552						09/06/96 0452
CCV		960618V	50.61018		50.0		101.2	% REC	09/06/96 0515
CCB		960802Z	0.00441						09/06/96 0517

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Sodium (Na)

Batch.....: 12875

Reporting Limit....: 5

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960410Z	203.95697		200.0		102.0	% REC	09/05/96 2153
3		960802Z	1.86757						09/05/96 2222



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Sodium (Na)

Batch.....: 12875
Reporting Limit....: 5
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ISA		960323A	509.76318		500		102.0	% REC	09/05/96 2235
ISB		960630H	495.73632		500		99.1	% REC	09/05/96 2314
MD	962369-1		33.19306			32.72796	1.4	RPD	09/05/96 2326
PDS	962369-2	960630G	80.90220		50	26.86231	108.1	% REC	09/05/96 2330
CCV		960618U	499.61929		500.00		99.9	% REC	09/05/96 2359
CCB		960802Z	-1.03325						09/06/96 0008
ISA		960323A	518.07354		500		103.6	% REC	09/06/96 0039
ISB		960630H	501.43313		500		100.3	% REC	09/06/96 0041
CCV		960618U	481.87326		500.00		96.4	% REC	09/06/96 0049
CCB		960802Z	1.97169						09/06/96 0101
CCV		960618U	521.80004		500.00		104.4	% REC	09/06/96 0123
CCB		960802Z	1.00928						09/06/96 0126
CCV		960618U	521.75695		500.00		104.4	% REC	09/06/96 0149
CCB		960802Z	1.05229						09/06/96 0153
CCV		960618U	521.68188		500.00		104.3	% REC	09/06/96 0215
CCB		960802Z	-3.47160						09/06/96 0218
CCV		960618U	533.89672		500.00		106.8	% REC	09/06/96 0239
CCB		960802Z	-4.23369						09/06/96 0243
CCV		960618U	528.10034		500.00		105.6	% REC	09/06/96 0302
CCB		960802Z	-2.08213						09/06/96 0306
ISA		960323A	520.13159		500		104.0	% REC	09/06/96 0315
ISB		960630H	497.02700		500		99.4	% REC	09/06/96 0318
CCV		960618U	512.07666		500.00		102.4	% REC	09/06/96 0321
CCB		960802Z	1.50474						09/06/96 0352
CCB		960802Z	1.12723						09/06/96 0421
CCB		960802Z	0.49189						09/06/96 0452
ISA		960323A	526.57055		500		105.3	% REC	09/06/96 0510
ISB		960630H	501.34634		500		100.3	% REC	09/06/96 0512
CCB		960802Z	-3.07290						09/06/96 0517

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Strontium (Sr)

Batch.....: 12875
Reporting Limit....: 0.01
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960410Z	0.94146		1.00		94.1	% REC	09/05/96 2153
ICB		960802Z	-0.00161						09/05/96 2222
ISB		960630H	1.00805		1.0000		100.8	% REC	09/05/96 2314
MD	962369-1		0.36084			0.35862	0.6	RPD	09/05/96 2326
PDS	962369-2	960630G	1.28860		1.0000	0.37012	91.8	% REC	09/05/96 2330
CCV		960618V	10.06843		10.0		100.7	% REC	09/06/96 0001
CCB		960802Z	0.00141						09/06/96 0008
ISB		960630H	1.02972		1.0000		103.0	% REC	09/06/96 0041
CCV		960618V	9.86561		10.0		98.7	% REC	09/06/96 0058
CCB		960802Z	0.00040						09/06/96 0101
CCV		960618V	9.99174		10.0		99.9	% REC	09/06/96 0125
CCB		960802Z	0.00343						09/06/96 0126
CCV		960618V	9.69810		10.0		97.0	% REC	09/06/96 0151
CCB		960802Z	0.00161						09/06/96 0153
CCV		960618V	10.11263		10.0		101.1	% REC	09/06/96 0217
CCB		960802Z	0.00161						09/06/96 0218



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 12875

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.01

Parameter.....: Strontium (Sr)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960618V	10.29346		10.0		102.9	% REC	09/06/96 0241
CCB		960802Z	0.00343						09/06/96 0243
CCV		960618V	10.07186		10.0		100.7	% REC	09/06/96 0304
CCB		960802Z	0.00484						09/06/96 0306
ISB		960630H	1.01658		1.0000		101.7	% REC	09/06/96 0318
CCV		960618V	9.63412		10.0		96.3	% REC	09/06/96 0350
CCB		960802Z	0.00141						09/06/96 0352
CCV		960618V	9.48760		10.0		94.9	% REC	09/06/96 0418
CCB		960802Z	0.00121						09/06/96 0421
CCV		960618V	9.85269		10.0		98.5	% REC	09/06/96 0449
CCB		960802Z	0.00201						09/06/96 0452
ISB		960630H	1.03882		1.0000		103.9	% REC	09/06/96 0512
CCV		960618V	9.90395		10.0		99.0	% REC	09/06/96 0515
CCB		960802Z	0.00222						09/06/96 0517

Test Method.....: SW-846 6010A

Batch.....: 12875

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.05

Parameter.....: Tin (Sn)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960410Z	0.91078		1.00		91.1	% REC	09/05/96 2153
ICB		960802Z	-0.03469						09/05/96 2222
ISB		960630H	0.95589		1.000		95.6	% REC	09/05/96 2314
MD	962369-1		-0.02330			-0.02031	0.00299	ABS Diff.	09/05/96 2326
POS	962369-2	960630G	0.76579		1.000	-0.03686	80.3	% REC	09/05/96 2330
CCV		960618V	2.59407		2.5		103.8	% REC	09/06/96 0001
CCB		960802Z	-0.03758						09/06/96 0008
ISB		960630H	0.90606		1.000		90.6	% REC	09/06/96 0041
CCV		960618V	2.66572		2.5		106.6	% REC	09/06/96 0058
CCB		960802Z	-0.04052						09/06/96 0101
CCV		960618V	2.66280		2.5		106.5	% REC	09/06/96 0125
CCB		960802Z	-0.03614						09/06/96 0126
CCV		960618V	2.53151		2.5		101.3	% REC	09/06/96 0151
CCB		960802Z	-0.03542						09/06/96 0153
CCV		960618V	2.58135		2.5		103.3	% REC	09/06/96 0217
CCB		960802Z	-0.03107						09/06/96 0218
CCV		960618V	2.61802		2.5		104.7	% REC	09/06/96 0241
CCB		960802Z	-0.04118						09/06/96 0243
CCV		960618V	2.61512		2.5		104.6	% REC	09/06/96 0304
CCB		960802Z	-0.03903						09/06/96 0306
ISB		960630H	0.87982		1.000		88.0	% REC	09/06/96 0318
CCV		960618V	2.60381		2.5		104.2	% REC	09/06/96 0350
CCB		960802Z	-0.04120						09/06/96 0352
CCV		960618V	2.59241		2.5		103.7	% REC	09/06/96 0418
CCB		960802Z	-0.02963						09/06/96 0421
CCV		960618V	2.57709		2.5		103.1	% REC	09/06/96 0449
CCB		960802Z	-0.03036						09/06/96 0452
ISB		960630H	0.94774		1.000		94.8	% REC	09/06/96 0512
CCV		960618V	2.59450		2.5		103.8	% REC	09/06/96 0515
		960802Z	-0.02239						09/06/96 0517



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHENGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Titanium (Ti)

Batch.....: 12875

Reporting Limit....: 0.01

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Z	1.97950		2.00		99.0	% REC	09/05/96 2110
ICB		960802Z	-0.00044						09/05/96 2222
ISB		960630H	0.94465		1.000		94.5	% REC	09/05/96 2314
MD	962369-1		0.00073			0.00072	0.00001	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.93347		1.000	0.00384	93.0	% REC	09/05/96 2330
CCV		960618V	2.50897		2.5		100.4	% REC	09/06/96 0001
CCB		960802Z	0.00000						09/06/96 0008
ISB		960630H	0.95890		1.000		95.9	% REC	09/06/96 0041
CCV		960618V	2.46132		2.5		98.5	% REC	09/06/96 0058
CCB		960802Z	0.00005						09/06/96 0101
CCV		960618V	2.48819		2.5		99.5	% REC	09/06/96 0125
CCB		960802Z	0.00156						09/06/96 0126
CCV		960618V	2.42122		2.5		96.8	% REC	09/06/96 0151
CCB		960802Z	0.00207						09/06/96 0153
CCV		960618V	2.49268		2.5		99.7	% REC	09/06/96 0217
CCB		960802Z	0.00045						09/06/96 0218
CCV		960618V	2.52971		2.5		101.2	% REC	09/06/96 0241
CCB		960802Z	0.00144						09/06/96 0243
CCV		960618V	2.49830		2.5		99.9	% REC	09/06/96 0304
CCB		960802Z	0.00098						09/06/96 0306
ISB		960630H	0.94896		1.000		94.9	% REC	09/06/96 0318
CCV		960618V	2.41055		2.5		96.4	% REC	09/06/96 0350
CCB		960802Z	0.00158						09/06/96 0352
CCV		960618V	2.36588		2.5		94.6	% REC	09/06/96 0418
CCB		960802Z	0.00105						09/06/96 0421
CCV		960618V	2.43078		2.5		97.2	% REC	09/06/96 0449
CCB		960802Z	0.00205						09/06/96 0452
ISB		960630H	0.95797		1.000		95.8	% REC	09/06/96 0512
CCV		960618V	2.44093		2.5		97.6	% REC	09/06/96 0515
CCB		960802Z	0.00045						09/06/96 0517

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Vanadium (V)

Batch.....: 12875

Reporting Limit....: 0.05

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Z	2.02998		2.00		101.5	% REC	09/05/96 2110
ICB		960802Z	-0.00157						09/05/96 2222
ISB		960630H	0.46095		0.5000		92.2	% REC	09/05/96 2314
MD	962369-1		-0.00032			-0.00019	0.00013	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.96962		1.000	0.00011	97.0	% REC	09/05/96 2330
CCV		960618V	2.53676		2.5		101.5	% REC	09/06/96 0001
CCB		960802Z	-0.00219						09/06/96 0008
ISB		960630H	0.47146		0.5000		94.3	% REC	09/06/96 0041
CCV		960618V	2.49313		2.5		99.7	% REC	09/06/96 0058
CCB		960802Z	-0.00008						09/06/96 0101
CCV		960618V	2.50958		2.5		100.4	% REC	09/06/96 0125
CCB		960802Z	-0.00180						09/06/96 0126
CCV		960618V	2.46379		2.5		98.6	% REC	09/06/96 0151
CCB		960802Z	-0.00206						09/06/96 0153
CCV		960618V	2.52850		2.5		101.1	% REC	09/06/96 0217



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Vanadium (V)

Batch.....: 12875
Reporting Limit....: 0.05
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCB		960802Z	-0.00161						09/06/96 0218
CCV		960618V	2.55490		2.5		102.2	% REC	09/06/96 0241
CCB		960802Z	-0.00099						09/06/96 0243
CCV		960618V	2.50790		2.5		100.3	% REC	09/06/96 0304
CCB		960802Z	0.00137						09/06/96 0306
ISB		960630H	0.46396		0.5000		92.8	% REC	09/06/96 0318
CCV		960618V	2.43083		2.5		97.2	% REC	09/06/96 0350
CCB		960802Z	-0.00015						09/06/96 0352
CCV		960618V	2.40489		2.5		96.2	% REC	09/06/96 0418
CCB		960802Z	-0.00131						09/06/96 0421
CCV		960618V	2.46433		2.5		98.6	% REC	09/06/96 0449
CCB		960802Z	-0.00123						09/06/96 0452
ISB		960630H	0.46574		0.5000		93.1	% REC	09/06/96 0512
CCV		960618V	2.46668		2.5		98.7	% REC	09/06/96 0515
CCB		960802Z	-0.00065						09/06/96 0517

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Zinc (Zn)

Batch.....: 12875
Reporting Limit....: 0.01
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960618Z	1.98715		2.00		99.4	% REC	09/05/96 2110
ICB		960802Z	0.00075						09/05/96 2222
ISB		960630H	0.92179		1.000		92.2	% REC	09/05/96 2314
MD	962369-1		0.00096			0.00326	0.00230	ABS Diff.	09/05/96 2326
PDS	962369-2	960630G	0.97507		1.000	0.00097	97.4	% REC	09/05/96 2330
CCV		960618V	2.54811		2.5		101.9	% REC	09/06/96 0001
CCB		960802Z	0.00075						09/06/96 0008
ISB		960630H	0.93594		1.000		93.6	% REC	09/06/96 0041
CCV		960618V	2.57736		2.5		103.1	% REC	09/06/96 0058
CCB		960802Z	0.00151						09/06/96 0101
CCV		960618V	2.58199		2.5		103.3	% REC	09/06/96 0125
CCB		960802Z	0.00149						09/06/96 0126
CCV		960618V	2.52103		2.5		100.8	% REC	09/06/96 0151
CCB		960802Z	0.00150						09/06/96 0153
CCV		960618V	2.49947		2.5		100.0	% REC	09/06/96 0217
CCB		960802Z	0.00150						09/06/96 0218
CCV		960618V	2.54343		2.5		101.7	% REC	09/06/96 0241
CCB		960802Z	0.00229						09/06/96 0243
CCV		960618V	2.55032		2.5		102.0	% REC	09/06/96 0304
CCB		960802Z	0.00151						09/06/96 0306
ISB		960630H	0.93558		1.000		93.6	% REC	09/06/96 0318
CCV		960618V	2.52164		2.5		100.9	% REC	09/06/96 0350
CCB		960802Z	0.00153						09/06/96 0352
CCV		960618V	2.47458		2.5		99.0	% REC	09/06/96 0418
CCB		960802Z	-0.00001						09/06/96 0421
CCV		960618V	2.51789		2.5		100.7	% REC	09/06/96 0449
CCB		960802Z	0.00152						09/06/96 0452
ISB		960630H	0.93436		1.000		93.4	% REC	09/06/96 0512
/		960618V	2.49314		2.5		99.7	% REC	09/06/96 0515
}		960802Z	0.00074						09/06/96 0517



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 7470
Method Description.: Mercury (CVAA)
Parameter.....: Mercury (Hg)

Batch.....: 12891
Reporting Limit...: 0.0002
Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960624G	0.003815		0.004000		95.4	% REC	09/06/96 1000
ICB		0906	0.000043						09/06/96 1001
MB		0905	0.000043						09/06/96 1002
MD	962422-3		0.000273			0.000273	0.00000	ABS Diff.	09/06/96 1006
CCV		950929N	0.004873		0.005000		97.5	% REC	09/06/96 1010
CCB		09066	0.000043						09/06/96 1011
MD	962369-1		0.000043			0.000043	0.00000	ABS Diff.	09/06/96 1013
MS	962369-2	950929N	0.004919		0.005000	0.000043	97.5	% REC	09/06/96 1015
CCV		950929N	0.004643		0.005000		92.9	% REC	09/06/96 1021
CCB		09066	0.000043						09/06/96 1022
MB		0905	0.000043						09/06/96 1025
MB		0905	0.000043						09/06/96 1026
EB		1311	0.000043						09/06/96 1027
SB		950929N	0.005149		0.005000		103.0	% REC	09/06/96 1028
ED	962291-1		0.000043			0.000043	0.00000	ABS Diff.	09/06/96 1030
MD	962291-1		0.000043			0.000043	0.00000	ABS Diff.	09/06/96 1030
CCV		950929N	0.005195		0.005000		103.9	% REC	09/06/96 1031
CCB		09066	0.000043						09/06/96 1032
MS	962291-1	950929N	0.004827		0.005000	0.000043	95.7	% REC	09/06/96 1033
EB		1311	0.000043						09/06/96 1034
SB		950929N	0.004873		0.005000		97.5	% REC	09/06/96 1035
MS	962299-2	950929N	0.005011		0.005000	0.000043	99.4	% REC	09/06/96 1037
MD	962299-9		0.000043			0.000043	0.00000	ABS Diff.	09/06/96 1040
ED	962299-9		0.000043			0.000043	0.00000	ABS Diff.	09/06/96 1041
CCV		950929N	0.005057		0.005000		101.1	% REC	09/06/96 1042
CCB		09066	0.000043						09/06/96 1043
EB		1311	0.000043						09/06/96 1046
SB		950929N	0.005195		0.005000		103.9	% REC	09/06/96 1047
MS	962377-1	950929N	0.005103		0.005000	0.000043	101.2	% REC	09/06/96 1049
ED	962377-21		0.000043			0.000043	0.00000	ABS Diff.	09/06/96 1051
CCV		950929N	0.004873		0.005000		97.5	% REC	09/06/96 1052
CCB		09066	0.000043						09/06/96 1053
MD	962377-21		0.000043			0.000043	0.00000	ABS Diff.	09/06/96 1054
PDS	962428-3	950929N	0.005190		0.005000	0.000043	102.9	% REC	09/06/96 1057
CCV		950929N	0.005011		0.005000		100.2	% REC	09/06/96 1059
CCB		09066	0.000043						09/06/96 1100

Test Method.....: EPA 160.1
Method Description.: Solids, Total Dissolved (TDS)
Parameter.....: Solids, Total Dissolved (TDS)

Batch.....: 12893
Reporting Limit...: 10
Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
MB			0						09/05/96 0800
LCS		G960724A	548		500		109.6	% REC	09/05/96 0800
MD	962419-6		1766			1780	0.8	RPD	09/05/96 0800



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 7841
Method Description.: Thallium (GFAA)
Parameter.....: Thallium (Tl)

Batch.....: 12959
Reporting Limit....: 0.005
Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960722B	0.04035		0.0400		100.9	% REC	09/06/96 1039
ICB		09066	-0.00005						09/06/96 1045
MB		0903	-0.00099						09/06/96 1055
LCS		960829H	0.03959		0.040000		99.0	% REC	09/06/96 1058
MD	962397-1		-0.00038			0.00020	0.00058	ABS Diff.	09/06/96 1109
SD	962205-2		-0.00061			-0.00017		% Diff.	09/06/96 1118
CCV		960722C	0.04884		0.050		97.7	% REC	09/06/96 1137
CCB		09066	0.00042						09/06/96 1140
MS	962398-1	960624L	0.00274		0.004000	0.00020	63.5	% REC	09/06/96 1148
PDS	962398-1	960401C	0.01668		0.020000	0.00020	82.4	% REC	09/06/96 1151
CCV		960722C	0.05013		0.050		100.3	% REC	09/06/96 1154
CCB		09066	0.00043						09/06/96 1157
MD	962419-1		-0.00023			-0.00016	0.00007	ABS Diff.	09/06/96 1323
PDS	962419-5	960401C	0.02273		0.020000	-0.00021	114.7	% REC	09/06/96 1331
SD	962419-6		-0.00055			-0.00006		% Diff.	09/06/96 1337
CCV		960722C	0.05094		0.050		101.9	% REC	09/06/96 1348
CCB		09066	0.00060						09/06/96 1351
		0906	-0.00096						09/06/96 1404
		960829H	0.04046		0.040000		101.2	% REC	09/06/96 1406
MS	962442-1	960624L	0.01573		0.020000	-0.00032	80.2	% REC	09/06/96 1412
MD	962422-3		-0.00163			-0.00208	0.00045	ABS Diff.	09/06/96 1417
MB		0906	-0.00093						09/06/96 1420
MD	962428-1		-0.00095			-0.00086	0.00009	ABS Diff.	09/06/96 1429
CCV		960722C	0.05225		0.050		104.5	% REC	09/06/96 1431
CCB		09066	0.00033						09/06/96 1434
MS	962428-2	960624L	0.01595		0.020000	-0.00047	82.1	% REC	09/06/96 1440
CCV		960722C	0.05153		0.050		103.1	% REC	09/06/96 1443
CCB		09066	-0.00014						09/06/96 1446
PDS	962442-1	960401C	0.01671		0.020000	-0.00032	85.2	% REC	09/06/96 1454
LCS		960829H	0.04252		0.040000		106.3	% REC	09/06/96 1456
PDS	962428-2	960401C	0.01638		0.020000	-0.00047	84.2	% REC	09/06/96 1459
CCV		960722C	0.05043		0.050		100.9	% REC	09/06/96 1502
CCB		09066	-0.00034						09/06/96 1505

Test Method.....: EPA 375.2
Method Description.: Sulfate (Automated MTB, AAIL)
Parameter.....: Sulfate (SO4)

Batch.....: 13002
Reporting Limit....: 10.
Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICL		G951103A	50.26934		50.0		100.5	% REC	09/09/96 1430
ICB			0.08168						09/09/96 1430
CCV		G960415E	80.72743		80		100.9	% REC	09/09/96 1430
CCB			0.79986						09/09/96 1430
MD	960850-89		29.57952			30.26809	0.68857	ABS Diff.	09/09/96 1430
MS	960850-89	G960610A	79.23975		50.000000	30.26809	97.9	% REC	09/09/96 1430
LCS		G951103A	51.39635		50.0		102.8	% REC	09/09/96 1430
CCV		G960415E	80.13237		80		100.2	% REC	09/09/96 1430
CCB			1.51712						09/09/96 1430
MD	960850-92		41.59883			41.82576	0.22693	ABS Diff.	09/09/96 1430
MS	960850-92	G960610A	88.76132		50.000000	41.82576	93.9	% REC	09/09/96 1430
		G960415E	80.50429		80		100.6	% REC	09/09/96 1430



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: EPA 375.2

Method Description.: Sulfate (Automated MTB, AAII)

Parameter.....: Sulfate (SO4)

Batch.....: 13002

Reporting Limit....: 10.

Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCB			0.00183						09/09/96 1430
LCS		G951103A	50.11901		50.0		100.2	% REC	09/09/96 1430
CCV		G960415E	78.71904		80		98.4	% REC	09/09/96 1430
CCB			0.00183						09/09/96 1430
MD	962115-36		46.80782			37.43053	9.37729	ABS Diff.	09/09/96 1430
MS	962115-36	G960610A	88.31487		50.000000	37.43053	101.8	% REC	09/09/96 1430
CCV		G960415E	80.20676		80		100.3	% REC	09/09/96 1430
CCB			0.08168						09/09/96 1430

Test Method.....: ASTM 3111B

Method Description.: Bismuth & Gallium (FLAA)

Parameter.....: Bismuth (Bi)

Batch.....: 13029

Reporting Limit....: 1

Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		951219D	19.71		20.04		98.4	% REC	09/09/96 1430
ICB		09096	0.09						09/09/96 1431
MB		0906	0.42						09/09/96 1432
EB		1320	0.35						09/09/96 1433
SB		950727	10.50		10.020000		104.8	% REC	09/09/96 1434
MS	962377-12	950727	9.92		10.020000	-0.46	103.6	% REC	09/09/96 1437
MD	962377-22		-0.90			-0.62	0.28	ABS Diff.	09/09/96 1439
ED	962377-22		-0.74			-0.62	0.12	ABS Diff.	09/09/96 1440
CCV		960909G	24.95		25.000000		99.8	% REC	09/09/96 1443
CCB		09096	-0.14						09/09/96 1444
MD	962377-1		-0.60			-0.42	0.18	ABS Diff.	09/09/96 1449
ED	962377-21		-0.70			-0.71	0.01	ABS Diff.	09/09/96 1451
MS	962377-31	950727	9.54		10.020000	-0.53	100.5	% REC	09/09/96 1453
CCV		960909G	25.24		25.000000		101.0	% REC	09/09/96 1455
CCB		09096	0.05						09/09/96 1456
MD	962377-51		0.29			0.65	0.36	ABS Diff.	09/09/96 1458
EB		1320	0.08						09/09/96 1459
SB		950727	9.36		10.020000		93.4	% REC	09/09/96 1500
MD	962419-1		-0.09			0.04	0.13	ABS Diff.	09/09/96 1502
PDS	962419-5	950727	9.51		10.020000	-0.95	104.4	% REC	09/09/96 1505
CCV		960909G	26.08		25.000000		104.3	% REC	09/09/96 1508
CCB		09096	-0.12						09/09/96 1509
SD	962419-10		-0.50			-0.63		% Diff.	09/09/96 1513
CCV		960909G	25.37		25.000000		101.5	% REC	09/09/96 1514
CCB		09096	-0.62						09/09/96 1515

Test Method.....: ASTM 3111B

Method Description.: Bismuth & Gallium (FLAA)

Parameter.....: Gallium (Ga)

Batch.....: 13030

Reporting Limit....: 0.5

Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		951219D	18.42		20.12		91.6	% REC	09/09/96 1620
ICB		09096	0.15						09/09/96 1621
MB		0906	0.17						09/09/96 162
EB		1320	0.23						09/09/96 162



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: ASTM 3111B

Method Description.: Bismuth & Gallium (FLAA)

Parameter.....: Gallium (Ga)

Batch.....: 13030

Reporting Limit....: 0.5

Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
SB		950729	9.65		10.060000		95.9	% REC	09/09/96 1622
MS	962377-12	950729	9.95		10.060000	0.22	96.7	% REC	09/09/96 1624
MD	962377-22		0.37			0.23	0.14	ABS Diff.	09/09/96 1625
ED	962377-22		0.23			0.23	0.00	ABS Diff.	09/09/96 1626
CCV		960909G	23.96		25.000000		95.8	% REC	09/09/96 1627
CCB		09096	0.40						09/09/96 1627
SD	962377-52		0.32			0.37		% Diff.	09/09/96 1629
MD	962377-1		0.36			0.39	0.03	ABS Diff.	09/09/96 1630
ED	962377-21		0.31			0.37	0.06	ABS Diff.	09/09/96 1632
MS	962377-31	950729	10.73		10.060000	0.45	102.2	% REC	09/09/96 1633
CCV		960909G	23.46		25.000000		93.8	% REC	09/09/96 1633
CCB		09096	0.05						09/09/96 1634
MD	962377-51		0.02			0.02	0.00	ABS Diff.	09/09/96 1636
EB		1320	0.07						09/09/96 1636
SB		950729	9.34		10.060000		92.8	% REC	09/09/96 1637
MD	962419-1		0.01			0.09	0.08	ABS Diff.	09/09/96 1638
PDS	962419-5	950729	9.63		10.060000	0.08	94.9	% REC	09/09/96 1639
		960909G	23.22		25.000000		92.9	% REC	09/09/96 1640
		09096	0.12						09/09/96 1641
SD	962419-10		0.08			0.20		% Diff.	09/09/96 1643
CCV		960909G	24.86		25.000000		99.4	% REC	09/09/96 1644
CCB		09096	0.21						09/09/96 1644

Test Method.....: EPA 150.1

Method Description.: pH

Parameter.....: pH

Batch.....: 13031

Reporting Limit....: 0.01

Units.....: pH Units

Analyst....: dem

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		G960604A	4.02		4.00		100.5	% REC	09/10/96 1045
MD	962419-9		8.13			8.10	0.4	RPD	09/10/96 1045
CCV		960258	6.98		7.00		99.7	% REC	09/10/96 1045
CCV		960258	6.98		7.00		99.7	% REC	09/10/96 1045

Test Method.....: EPA 310.1

Method Description.: Alkalinity

Parameter.....: Alkalinity, Total as CaCO3

Batch.....: 13032

Reporting Limit....: 5

Units.....: mg/L CaCO3

Analyst....: dem

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
MB			0						09/10/96 1045
LCS		G960725A	107		100		107.0	% REC	09/10/96 1045
MD	962419-9		154			154	0.0	RPD	09/10/96 1045



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Barium (Ba)

Batch.....: 13074
Reporting Limit...: 0.5
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960501Q	1.03266		1.00		103.3	% REC	09/10/96 1327
ICB		960729M	0.00000						09/10/96 1400
ISB		960630H	0.50198		0.5000		100.4	% REC	09/10/96 1422
MB		0910	0.00007						09/10/96 1445
CCV		960620AA	5.17297		5.0		103.5	% REC	09/10/96 1531
CCB		960729M	0.00084						09/10/96 1539
CCV		960620AA	4.99762		5.0		100.0	% REC	09/10/96 2225
CCB		960729M	0.00030						09/10/96 2336
CCV		960620AA	4.97911		5.0		99.6	% REC	09/11/96 0017
CCB		960729M	0.00015						09/11/96 0033
MB		0910	0.00045						09/11/96 0054
LCS		960829H	0.98555		1.00		98.6	% REC	09/11/96 0100
MD	962447-1		0.10895			0.10797	0.00098	ABS Diff.	09/11/96 0109
MS	962447-2	960630G	1.05448		1.000	0.09834	95.6	% REC	09/11/96 0117
CCV		960620AA	4.93645		5.0		98.7	% REC	09/11/96 0129
CCB		960729M	-0.00030						09/11/96 0140
MB		0910	0.00022						09/11/96 0159
LCS		960829H	0.96508		1.00		96.5	% REC	09/11/96 0206
SB		960630G	0.95418		1.000		95.4	% REC	09/11/96 0220
MD	962419-3		0.07005			0.06915	0.00090	ABS Diff.	09/11/96 0226
MS	962419-4	960630G	1.15787		1.000	0.20519	95.3	% REC	09/11/96 0231
CCV		960620AA	4.99062		5.0		99.8	% REC	09/11/96 0241
CCB		960729M	0.00030						09/11/96 0249
MD	962393-1		0.06177			0.06117	0.00060	ABS Diff.	09/11/96 0307
CCV		960620AA	4.90921		5.0		98.2	% REC	09/11/96 0322
CCB		960729M	0.00030						09/11/96 0333
MS	962393-2	960630G	1.00647		1.000	0.11015	89.6	% REC	09/11/96 0335
PDS	962393-2	960630G	0.95184		1.000	0.02257	92.9	% REC	09/11/96 0339
CCV		960620AA	5.11244		5.0		102.2	% REC	09/11/96 0406
CCB		960729M	0.00233						09/11/96 0408
ISB		960630H	0.49320		0.5000		98.6	% REC	09/11/96 0425
CCV		960620AA	5.08174		5.0		101.6	% REC	09/11/96 0434
CCB		960729M	0.00067						09/11/96 0440

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Cadmium (Cd)

Batch.....: 13074
Reporting Limit...: 0.01
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.00397		2.00		100.2	% REC	09/10/96 1133
ICB		960729M	0.00060						09/10/96 1400
ISB		960630H	0.98648		1.000		98.6	% REC	09/10/96 1422
MB		0910	-0.00120						09/10/96 1445
CCV		960620AA	2.54658		2.5		101.9	% REC	09/10/96 1531
CCB		960729M	0.00002						09/10/96 1539
CCV		960620AA	2.62145		2.5		104.9	% REC	09/10/96 2225
CCB		960729M	0.00188						09/10/96 2336
CCV		960620AA	2.52183		2.5		100.9	% REC	09/11/96 0017
CCB		960729M	0.00059						09/11/96 0033
MB		0910	0.00117						09/11/96 0054
LCS		960829H	0.89404		1.00		89.4	% REC	09/11/96 0100



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 13074

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.01

Parameter.....: Cadmium (Cd)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
MD	962447-1		0.00002			0.00057	0.00055	ABS Diff.	09/11/96 0109
MS	962447-2	960630G	0.88268		1.000	0.00233	88.0	% REC	09/11/96 0117
CCV		960620AA	2.47930		2.5		99.2	% REC	09/11/96 0129
CCB		960729M	0.00117						09/11/96 0140
MB		0910	0.00001						09/11/96 0159
LCS		960829H	0.87937		1.00		87.9	% REC	09/11/96 0206
SB		960630G	0.88799		1.000		88.8	% REC	09/11/96 0220
MD	962419-3		-0.00112			0.00118	0.00230	ABS Diff.	09/11/96 0226
MS	962419-4	960630G	0.86392		1.000	0.00003	86.4	% REC	09/11/96 0231
CCV		960620AA	2.43708		2.5		97.5	% REC	09/11/96 0241
CCB		960729M	-0.00000						09/11/96 0249
MD	962393-1		-0.00001			0.00056	0.00057	ABS Diff.	09/11/96 0307
CCV		960620AA	2.39814		2.5		95.9	% REC	09/11/96 0322
CCB		960729M	0.00056						09/11/96 0333
MS	962393-2	960630G	0.82985		1.000	-0.00059	83.0	% REC	09/11/96 0335
PDS	962393-2	960630G	0.86838		1.000	-0.00058	86.9	% REC	09/11/96 0339
CCV		960620AA	2.48652		2.5		99.5	% REC	09/11/96 0406
B		960729M	0.00231						09/11/96 0408
B		960630H	0.91817		1.000		91.8	% REC	09/11/96 0425
CCV		960620AA	2.40524		2.5		96.2	% REC	09/11/96 0434
CCB		960729M	0.00059						09/11/96 0440

Test Method.....: SW-846 6010A

Batch.....: 13074

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.01

Parameter.....: Chromium (Cr)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	1.95040		2.00		97.5	% REC	09/10/96 1133
ICB		960729M	0.00156						09/10/96 1400
ISB		960630H	0.44423		0.5000		88.8	% REC	09/10/96 1422
MB		0910	0.00078						09/10/96 1445
CCV		960620AA	2.55080		2.5		102.0	% REC	09/10/96 1531
CCB		960729M	0.00039						09/10/96 1539
CCV		960620AA	2.53518		2.5		101.4	% REC	09/10/96 2225
CCB		960729M	0.00279						09/10/96 2336
CCV		960620AA	2.55885		2.5		102.4	% REC	09/11/96 0017
CCB		960729M	-0.00080						09/11/96 0033
MB		0910	0.00079						09/11/96 0054
LCS		960829H	0.98473		1.00		98.5	% REC	09/11/96 0100
MD	962447-1		0.00238			0.00117	0.00121	ABS Diff.	09/11/96 0109
MS	962447-2	960630G	0.93785		1.000	0.00276	93.5	% REC	09/11/96 0117
CCV		960620AA	2.51159		2.5		100.5	% REC	09/11/96 0129
CCB		960729M	-0.00119						09/11/96 0140
MB		0910	0.00118						09/11/96 0159
LCS		960829H	0.95029		1.00		95.0	% REC	09/11/96 0206
SB		960630G	0.94232		1.000		94.2	% REC	09/11/96 0220
MD	962419-3		0.07740			0.07779	0.5	RPD	09/11/96 0226
MS	962419-4	960630G	0.94485		1.000	0.03396	91.1	% REC	09/11/96 0231
CCV		960620AA	2.51077		2.5		100.4	% REC	09/11/96 0241
B		960729M	0.00159						09/11/96 0249
	962393-1		0.00259			0.00250	0.00009	ABS Diff.	09/11/96 0307



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 13074

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.01

Parameter.....: Chromium (Cr)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960620AA	2.46551		2.5		98.6	% REC	09/11/96 0322
CCB		960729M	0.00039						09/11/96 0333
MS	962393-2	960630G	0.85105		1.000	0.00442	84.7	% REC	09/11/96 0335
PDS	962393-2	960630G	0.89215		1.000	0.00078	89.1	% REC	09/11/96 0339
CCV		960620AA	2.56162		2.5		102.5	% REC	09/11/96 0406
CCB		960729M	-0.00040						09/11/96 0408
ISB		960630H	0.44316		0.5000		88.6	% REC	09/11/96 0425
CCV		960620AA	2.52714		2.5		101.1	% REC	09/11/96 0434
CCB		960729M	0.00079						09/11/96 0440

Test Method.....: SW-846 6010A

Batch.....: 13074

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.01

Parameter.....: Copper (Cu)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.02561		2.00		101.3	% REC	09/10/96 1133
ICB		960729M	-0.00073						09/10/96 1400
ISB		960630H	0.46041		0.5000		92.1	% REC	09/10/96 1422
MB		0910	0.00157						09/10/96 1445
CCV		960620AA	2.57378		2.5		103.0	% REC	09/10/96 1531
CCB		960729M	0.00422						09/10/96 1539
CCV		960620AA	2.55706		2.5		102.3	% REC	09/10/96 2225
CCB		960729M	0.00430						09/10/96 2336
CCV		960620AA	2.55777		2.5		102.3	% REC	09/11/96 0017
CCB		960729M	0.00391						09/11/96 0033
MB		0910	0.00242						09/11/96 0054
LCS		960829H	0.99811		1.00		99.8	% REC	09/11/96 0100
MD	962447-1		0.04684			0.04763	0.00079	ABS Diff.	09/11/96 0109
MS	962447-2	960630G	1.05787		1.000	0.09875	95.9	% REC	09/11/96 0117
CCV		960620AA	2.53645		2.5		101.5	% REC	09/11/96 0129
CCB		960729M	-0.00079						09/11/96 0140
MB		0910	0.00483						09/11/96 0159
LCS		960829H	0.97428		1.00		97.4	% REC	09/11/96 0206
SB		960630G	0.95164		1.000		95.2	% REC	09/11/96 0220
MD	962419-3		0.02732			0.02273	0.00459	ABS Diff.	09/11/96 0226
MS	962419-4	960630G	0.96283		1.000	0.00946	95.3	% REC	09/11/96 0231
CCV		960620AA	2.55437		2.5		102.2	% REC	09/11/96 0241
CCB		960729M	-0.00000						09/11/96 0249
MD	962393-1		0.56400			0.56043	0.6	RPD	09/11/96 0307
CCV		960620AA	2.51320		2.5		100.5	% REC	09/11/96 0322
CCB		960729M	0.00079						09/11/96 0333
MS	962393-2	960630G	9.38493		1.000	8.80986	57.5	% REC	09/11/96 0335
PDS	962393-2	960630G	2.70852		1.000	1.79738	91.1	% REC	09/11/96 0339
CCV		960620AA	2.61668		2.5		104.7	% REC	09/11/96 0406
CCB		960729M	0.00081						09/11/96 0408
ISB		960630H	0.46406		0.5000		92.8	% REC	09/11/96 0425
CCV		960620AA	2.59153		2.5		103.7	% REC	09/11/96 0434
CCB		960729M	0.00197						09/11/96 0440



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 13074

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.01

Parameter.....: Silver (Ag)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960501Q	0.99638		1.00		99.6	% REC	09/10/96 1327
ICB		960729M	0.00348						09/10/96 1400
ISB		960630H	0.86422		1.000		86.4	% REC	09/10/96 1422
MB		0910	0.00203						09/10/96 1445
CCV		960620BB	2.45966		2.500		98.4	% REC	09/10/96 1525
CCB		960729M	0.00249						09/10/96 1539
CCV		960620BB	2.61987		2.500		104.8	% REC	09/10/96 2222
CCB		960729M	0.00137						09/10/96 2336
CCV		960620BB	2.54512		2.500		101.8	% REC	09/11/96 0013
CCB		960729M	0.00160						09/11/96 0033
MB		0910	0.00131						09/11/96 0054
LCS		960829H	1.00836		1.00		100.8	% REC	09/11/96 0100
MD	962447-1		0.00426			0.00107	0.00319	ABS Diff.	09/11/96 0109
MS	962447-2	960630G	0.98471		1.000	0.00076	98.4	% REC	09/11/96 0117
CCV		960620BB	2.51601		2.500		100.6	% REC	09/11/96 0127
CCB		960729M	-0.00191						09/11/96 0140
MB		0910	0.00131						09/11/96 0159
		960829H	0.99358		1.00		99.4	% REC	09/11/96 0206
		960630G	1.01050		1.000		101.0	% REC	09/11/96 0220
MD	962419-3		-0.00005			-0.00075	0.00070	ABS Diff.	09/11/96 0226
MS	962419-4	960630G	0.86043		1.000	0.00052	86.0	% REC	09/11/96 0231
CCV		960620BB	2.44211		2.500		97.7	% REC	09/11/96 0235
CCB		960729M	0.00064						09/11/96 0249
MD	962393-1		-0.00009			-0.00072	0.00063	ABS Diff.	09/11/96 0307
CCV		960620BB	2.43956		2.500		97.6	% REC	09/11/96 0320
CCB		960729M	0.00127						09/11/96 0333
MS	962393-2	960630G	0.84876		1.000	0.00216	84.7	% REC	09/11/96 0335
PDS	962393-2	960630G	0.96921		1.000	0.00037	96.9	% REC	09/11/96 0339
CCV		960620BB	2.59247		2.500		103.7	% REC	09/11/96 0401
CCB		960729M	0.00095						09/11/96 0408
ISB		960630H	0.92392		1.000		92.4	% REC	09/11/96 0425
CCV		960620BB	2.53361		2.500		101.3	% REC	09/11/96 0432
CCB		960729M	0.00159						09/11/96 0440

Test Method.....: SW-846 6010A

Batch.....: 13074

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.1

Parameter.....: Zinc (Zn)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.00365		2.00		100.2	% REC	09/10/96 1133
ICB		960729M	0.00078						09/10/96 1400
ISB		960630H	0.96669		1.000		96.7	% REC	09/10/96 1422
MB		0910	0.00399						09/10/96 1445
CCV		960620AA	2.60435		2.5		104.2	% REC	09/10/96 1531
CCB		960729M	0.00158						09/10/96 1539
CCV		960620AA	2.58740		2.5		103.5	% REC	09/10/96 2225
CCB		960729M	0.00319						09/10/96 2336
CCV		960620AA	2.51328		2.5		100.5	% REC	09/11/96 0017
CCB		960729M	0.00150						09/11/96 0033
		0910	0.00072						09/11/96 0054
		960829H	0.90999		1.00		91.0	% REC	09/11/96 0100



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLO IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Zinc (Zn)

Batch.....: 13074
Reporting Limit....: 0.1
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
MD	962447-1		0.24516			0.24362	0.00154	ABS Diff.	09/11/96 0109
MS	962447-2	960630G	1.01761		1.000	0.14338	87.4	% REC	09/11/96 0117
CCV		960620AA	2.45946		2.5		98.4	% REC	09/11/96 0129
CCB		960729M	-0.00150						09/11/96 0140
MB		0910	0.00452						09/11/96 0159
LCS		960829H	0.88918		1.00		88.9	% REC	09/11/96 0206
SB		960630G	0.89515		1.000		89.5	% REC	09/11/96 0220
MD	962419-3		0.15446			0.14300	0.01146	ABS Diff.	09/11/96 0226
MS	962419-4	960630G	0.94140		1.000	0.06205	87.9	% REC	09/11/96 0231
CCV		960620AA	2.44727		2.5		97.9	% REC	09/11/96 0241
CCB		960729M	-0.00461						09/11/96 0249
MD	962393-1		0.00817			0.01296	0.00479	ABS Diff.	09/11/96 0307
CCV		960620AA	2.38839		2.5		95.5	% REC	09/11/96 0322
CCB		960729M	-0.00462						09/11/96 0333
MS	962393-2	960630G	0.86206		1.000	0.02811	83.4	% REC	09/11/96 0335
PDS	962393-2	960630G	0.87499		1.000	0.00461	87.0	% REC	09/11/96 0339
CCV		960620AA	2.47955		2.5		99.2	% REC	09/11/96 0406
CCB		960729M	-0.00306						09/11/96 0408
ISB		960630H	0.89822		1.000		89.8	% REC	09/11/96 0425
CCV		960620AA	2.39930		2.5		96.0	% REC	09/11/96 0434
CCB		960729M	-0.00001						09/11/96 0440

Test Method.....: EPA 340.2
Method Description.: Fluoride (ISE)
Parameter.....: Fluoride (F)

Batch.....: 13077
Reporting Limit....: 0.1
Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICB			0.00						09/10/96 1400
ICL		G960621B	0.20		0.200000		100.0	% REC	09/10/96 1400
LCS		G960621B	4.40		4.000000		110.0	% REC	09/10/96 1400
MD	962419-1		0.00			0.00	0	ABS Diff.	09/10/96 1400
MS	962419-1	G960621A	1.10		1.000000	0.00	110.0	% REC	09/10/96 1400
CCV		G960621A	3.20		3.000030		106.7	% REC	09/10/96 1400
CCB			0.00						09/10/96 1400
LCS		G960621B	0.20		0.200000		100.0	% REC	09/10/96 1400
MD	962419-11		0.80			0.80	0.0	RPD	09/10/96 1400
MS	962419-11	G960621A	1.80		1.000000	0.80	100.0	% REC	09/10/96 1400
CCV		G960621A	3.00		3.000030		100.0	% REC	09/10/96 1400
CCB			0.00						09/10/96 1400

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Calcium (Ca)

Batch.....: 13080
Reporting Limit....: 0.1
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960412T	20.02144		20.000000		100.1	% REC	09/10/96 1355
ICB		960729M	0.01317						09/10/96 1400
CCV		960620AA	10.52302		10.0		105.2	% REC	09/10/96 153
CCB		960729M	0.00863						09/10/96 153



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 13080

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.1

Parameter.....: Calcium (Ca)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960620AA	10.29049		10.0		102.9	% REC	09/10/96 2225
CCB		960729M	0.00483						09/10/96 2336
CCV		960620AA	10.39010		10.0		103.9	% REC	09/11/96 0017
CCB		960729M	0.00532						09/11/96 0033
CCV		960620AA	10.22554		10.0		102.3	% REC	09/11/96 0129
CCB		960729M	0.00722						09/11/96 0140
MB		0910	0.01312						09/11/96 0159
LCS		960412T	19.65068		20.000000		98.3	% REC	09/11/96 0217
SB		960630G	45.56569		50.000		91.1	% REC	09/11/96 0220
CCV		960620AA	10.24869		10.0		102.5	% REC	09/11/96 0241
CCB		960729M	0.00651						09/11/96 0249
CCV		960620AA	10.22557		10.0		102.3	% REC	09/11/96 0322
CCB		960729M	0.00812						09/11/96 0333
CCV		960620AA	10.76189		10.0		107.6	% REC	09/11/96 0406
CCB		960729M	0.03303						09/11/96 0408
CCV		960620AA	10.57746		10.0		105.8	% REC	09/11/96 0434
CCB		960729M	0.00371						09/11/96 0440

Test Method.....: SW-846 6010A

Batch.....: 13080

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 1

Parameter.....: Calcium (Ca)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960412T	207.40396		200		103.7	% REC	09/10/96 1349
ICB		960729M	-0.48231						09/10/96 1400
ISA		960323A	520.77673		500		104.2	% REC	09/10/96 1408
ISB		960630H	501.98120		500		100.4	% REC	09/10/96 1422
CCV		960620BB	272.00482		250.00		108.8	% REC	09/10/96 1525
CCB		960729M	-0.49715						09/10/96 1539
CCV		960620BB	261.12670		250.00		104.5	% REC	09/10/96 2222
CCB		960729M	-0.65298						09/10/96 2336
CCV		960620BB	268.61376		250.00		107.4	% REC	09/11/96 0013
CCB		960729M	-0.59362						09/11/96 0033
CCV		960620BB	269.98651		250.00		108.0	% REC	09/11/96 0127
CCB		960729M	0.45329						09/11/96 0140
LCS		960412T	196.51483		200		98.3	% REC	09/11/96 0214
SB		960630G	49.08226		50		98.2	% REC	09/11/96 0220
MD	962419-3		86.38627			85.09326	1.5	RPD	09/11/96 0226
MS	962419-4	960630G	110.35149		50	57.09296	106.5	% REC	09/11/96 0231
CCV		960620BB	267.54107		250.00		107.0	% REC	09/11/96 0235
CCB		960729M	0.12595						09/11/96 0249
MD	962393-1		330.03381			332.93078	0.9	RPD	09/11/96 0309
CCV		960620BB	265.08505		250.00		106.0	% REC	09/11/96 0320
CCB		960729M	-0.39268						09/11/96 0333
PDS	962393-2	960630G	186.02188		50	139.62570	92.8	% REC	09/11/96 0339
CCV		960620BB	271.18667		250.00		108.5	% REC	09/11/96 0401
CCB		960729M	-0.63496						09/11/96 0408
ISA		960323A	509.29168		500		101.9	% REC	09/11/96 0413
ISB		960630H	485.09948		500		97.0	% REC	09/11/96 0425
V		960620BB	267.87780		250.00		107.2	% REC	09/11/96 0432
B		960729M	-0.52208						09/11/96 0440



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLO IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Iron (Fe)

Batch.....: 13080
Detection Limit....: 0.03
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960716T	1.98996		2.00		99.5	% REC		09/10/96 1133
ICB		960729M	0.00587							09/10/96 1400
ISA		960323A	177.09846		200		88.5	% REC		09/10/96 1408
ISB		960630H	169.30142		200		84.7	% REC		09/10/96 1422
CCV		960620AA	10.25751		10.0		102.6	% REC		09/10/96 1531
CCB		960729M	0.00705							09/10/96 1539
CCV		960620AA	10.19152		10.0		101.9	% REC		09/10/96 2225
CCB		960729M	0.00636							09/10/96 2336
CCV		960620AA	10.26468		10.0		102.6	% REC		09/11/96 0017
CCB		960729M	0.00795							09/11/96 0033
CCV		960620AA	10.05020		10.0		100.5	% REC		09/11/96 0129
CCB		960729M	0.00237							09/11/96 0140
MB		0910	0.15398						B	09/11/96 0159
LCS		960829H	0.99056		1.00		99.1	% REC		09/11/96 0206
SB		960630G	1.94711		2.0000		97.4	% REC		09/11/96 0220
MD	962419-3		2.86382			2.65734	7.5	RPD		09/11/96 0226
MS	962419-4	960630G	6.65379		2.0000	4.39282	113.0	% REC		09/11/96 0231
CCV		960620AA	10.06777		10.0		100.7	% REC		09/11/96 024
CCB		960729M	0.00597							09/11/96 024
MD	962393-1		3.74697			3.70398	1.2	RPD		09/11/96 0306
CCV		960620AA	9.82537		10.0		98.3	% REC		09/11/96 0322
CCB		960729M	0.00398							09/11/96 0333
MS	962393-2	960630G	1.92954		2.0000	0.03693	94.6	% REC		09/11/96 0335
PDS	962393-2	960630G	1.87260		2.0000	0.03693	91.8	% REC		09/11/96 0339
CCV		960620AA	10.27433		10.0		102.7	% REC		09/11/96 0406
CCB		960729M	0.00876							09/11/96 0408
ISA		960323A	177.17736		200		88.6	% REC		09/11/96 0413
ISB		960630H	170.17623		200		85.1	% REC		09/11/96 0425
CCV		960620AA	10.06385		10.0		100.6	% REC		09/11/96 0434
CCB		960729M	0.00557							09/11/96 0440

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Magnesium (Mg)

Batch.....: 13080
Detection Limit....: 0.1
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
ICV		960412T	20.53230		20.000000		102.7	% REC		09/10/96 1355
ICB		960729M	0.01101							09/10/96 1400
CCV		960620AA	26.88254		25.0		107.5	% REC		09/10/96 1531
CCB		960729M	0.00734							09/10/96 1539
CCV		960620AA	26.07390		25.0		104.3	% REC		09/10/96 2225
CCB		960729M	0.00058							09/10/96 2336
CCV		960620AA	26.40973		25.0		105.6	% REC		09/11/96 0017
CCB		960729M	0.00175							09/11/96 0033
CCV		960620AA	26.06891		25.0		104.3	% REC		09/11/96 0129
CCB		960729M	0.06560							09/11/96 0140
MB		0910	0.00263							09/11/96 0159
LCS		960412T	20.53288		20.000000		102.7	% REC		09/11/96 0217
SB		960630G	47.28234		50.000		94.6	% REC		09/11/96 0220
MD	962419-3		27.21106			27.36673	0.6	RPD		09/11/96 02
CCV		960620AA	26.02175		25.0		104.1	% REC		09/11/96 02



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 13080

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.1

Parameter.....: Magnesium (Mg)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCB		960729M	0.00366						09/11/96 0249
MD	962393-1		29.39204			29.21364	0.6	RPD	09/11/96 0309
CCV		960620AA	25.61267		25.0		102.5	% REC	09/11/96 0322
CCB		960729M	0.00205						09/11/96 0333
PDS	962393-2	960630G	49.37008		50.000	4.30028	90.1	% REC	09/11/96 0339
CCV		960620AA	26.65477		25.0		106.6	% REC	09/11/96 0406
CCB		960729M	0.03793						09/11/96 0408
CCV		960620AA	26.22621		25.0		104.9	% REC	09/11/96 0434
CCB		960729M	0.00351						09/11/96 0440

Test Method.....: SW-846 6010A

Batch.....: 13080

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.5

Parameter.....: Magnesium (Mg)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
		960412T	206.06640		200		103.0	% REC	09/10/96 1349
		960729M	-0.02563						09/10/96 1400
ISA		960323A	544.81237		500		109.0	% REC	09/10/96 1408
ISB		960630H	519.79736		500		104.0	% REC	09/10/96 1422
CCV		960620BB	256.19256		250.00		102.5	% REC	09/10/96 1525
CCB		960729M	-0.04549						09/10/96 1539
CCV		960620BB	245.31192		250.00		98.1	% REC	09/10/96 2222
CCB		960729M	-0.06663						09/10/96 2336
CCV		960620BB	253.68145		250.00		101.5	% REC	09/11/96 0013
CCB		960729M	-0.04100						09/11/96 0033
CCV		960620BB	252.78823		250.00		101.1	% REC	09/11/96 0127
CCB		960729M	0.14865						09/11/96 0140
MB		0910	-0.20247						09/11/96 0159
LCS		960412T	197.98521		200		99.0	% REC	09/11/96 0214
SB		960630G	50.11655		50		100.2	% REC	09/11/96 0220
MD	962419-3		29.47659			29.46890	0.0	RPD	09/11/96 0226
MS	962419-4	960630G	56.94250		50	6.50493	100.9	% REC	09/11/96 0231
CCV		960620BB	251.82904		250.00		100.7	% REC	09/11/96 0235
CCB		960729M	-0.04677						09/11/96 0249
MD	962393-1		63.12834			63.42757	0.5	RPD	09/11/96 0307
CCV		960620BB	249.55500		250.00		99.8	% REC	09/11/96 0320
CCB		960729M	-0.10316						09/11/96 0333
MS	962393-2	960630G	60.07835		50	5.81676	108.5	% REC	09/11/96 0335
PDS	962393-2	960630G	55.43224		50	5.81676	99.2	% REC	09/11/96 0339
CCV		960620BB	266.96173		250.00		106.8	% REC	09/11/96 0401
CCB		960729M	-0.09226						09/11/96 0408
ISA		960323A	561.97045		500		112.4	% REC	09/11/96 0413
ISB		960630H	526.50030		500		105.3	% REC	09/11/96 0425
CCV		960620BB	264.23400		250.00		105.7	% REC	09/11/96 0432
CCB		960729M	-0.10764						09/11/96 0440



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Sodium (Na)

Batch.....: 13080
Reporting Limit....: 1
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960412T	20.32190		20.000000		101.6	% REC	09/10/96 1355
ICB		960729M	0.00111						09/10/96 1400
CCV		960620AA	51.59115		50.0		103.2	% REC	09/10/96 1531
CCB		960729M	0.00667						09/10/96 1539
CCV		960620AA	50.31958		50.0		100.6	% REC	09/10/96 2225
CCB		960729M	-0.01422						09/10/96 2336
CCV		960620AA	50.53082		50.0		101.1	% REC	09/11/96 0017
CCB		960729M	-0.01094						09/11/96 0033
CCV		960620AA	50.60853		50.0		101.2	% REC	09/11/96 0129
CCB		960729M	0.07114						09/11/96 0140
MB		0910	0.25829						09/11/96 0159
LCS		960412T	20.13943		20.000000		100.7	% REC	09/11/96 0217
SB		960630G	48.48196		50.000		97.0	% REC	09/11/96 0220
CCV		960620AA	50.24735		50.0		100.5	% REC	09/11/96 0241
CCB		960729M	0.00656						09/11/96 0249
CCV		960620AA	49.35645		50.0		98.7	% REC	09/11/96 0322
CCB		960729M	0.01860						09/11/96 0333
CCV		960620AA	51.32650		50.0		102.7	% REC	09/11/96 0406
CCB		960729M	0.05362						09/11/96 0408
CCV		960620AA	50.51002		50.0		101.0	% REC	09/11/96 0434
CCB		960729M	-0.01751						09/11/96 0440

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Sodium (Na)

Batch.....: 13080
Reporting Limit....: 5
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960412T	214.15869		200		107.1	% REC	09/10/96 1349
ICB		960729M	0.02966						09/10/96 1400
ISA		960323A	510.23602		500		102.0	% REC	09/10/96 1408
ISB		960630H	486.08282		500		97.2	% REC	09/10/96 1422
CCV		960620BB	482.21655		500.0		96.4	% REC	09/10/96 1525
CCB		960729M	0.03922						09/10/96 1539
CCV		960620BB	465.30267		500.0		93.1	% REC	09/10/96 2222
CCB		960729M	-1.13492						09/10/96 2336
CCV		960620BB	485.17504		500.0		97.0	% REC	09/11/96 0013
CCB		960729M	-0.42229						09/11/96 0033
CCV		960620BB	482.76263		500.0		96.6	% REC	09/11/96 0127
CCB		960729M	4.18181						09/11/96 0140
LCS		960412T	195.97872		200		98.0	% REC	09/11/96 0214
SB		960630G	49.94403		50		99.9	% REC	09/11/96 0220
MD	962419-3		176.79080			176.03800	0.4	RPD	09/11/96 0226
MS	962419-4	960630G	190.32708		50	135.38729	109.9	% REC	09/11/96 0231
CCV		960620BB	470.29284		500.0		94.1	% REC	09/11/96 0235
CCB		960729M	-0.81865						09/11/96 0249
MD	962393-1		666.01184			665.87194	0.0	RPD	09/11/96 0307
CCV		960620BB	467.77688		500.0		93.6	% REC	09/11/96 0320
CCB		960729M	-2.43126						09/11/96 0333
MS	962393-2	960630G	595.04589		50	124.03788	942.0	% REC	09/11/96 0335
PDS	962393-2	960630G	169.18218		50	124.03788	90.3	% REC	09/11/96 033
CCV		960620BB	504.16577		500.0		100.8	% REC	09/11/96 040



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 13080

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 5

Parameter.....: Sodium (Na)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCB		960729M	-3.26687						09/11/96 0408
ISA		960323A	515.61511		500		103.1	% REC	09/11/96 0413
ISB		960630H	488.81134		500		97.8	% REC	09/11/96 0425
CCV		960620BB	491.68167		500.0		98.3	% REC	09/11/96 0432
CCB		960729M	-2.83685						09/11/96 0440

Test Method.....: SW-846 6010A

Batch.....: 13084

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.03

Parameter.....: Cobalt (Co)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.00843		2.00		100.4	% REC	09/10/96 1133
ICB		960729M	0.00098						09/10/96 1400
ISB		960630H	0.48232		0.5000		96.5	% REC	09/10/96 1422
CCV		960620AA	2.60806		2.5		104.3	% REC	09/10/96 1531
		960729M	0.00099						09/10/96 1539
		960620AA	2.57479		2.5		103.0	% REC	09/10/96 2225
CCB		960729M	0.00066						09/10/96 2336
CCV		960620AA	2.59570		2.5		103.8	% REC	09/11/96 0017
CCB		960729M	0.00199						09/11/96 0033
MB		0910	0.00133						09/11/96 0054
LCS		960829H	0.99222		1.00		99.2	% REC	09/11/96 0100
MD	962447-1		0.00158			0.00157	0.00001	ABS Diff.	09/11/96 0109
MS	962447-2	960630G	0.94432		1.000	0.00226	94.2	% REC	09/11/96 0117
CCV		960620AA	2.53426		2.5		101.4	% REC	09/11/96 0129
CCB		960729M	0.00033						09/11/96 0140
MB		0910	0.00265						09/11/96 0159
LCS		960829H	0.96034		1.00		96.0	% REC	09/11/96 0206
SB		960630G	0.95605		1.000		95.6	% REC	09/11/96 0220
MD	962419-3		0.00245			0.00445	0.00200	ABS Diff.	09/11/96 0226
MS	962419-4	960630G	0.93129		1.000	0.00713	92.4	% REC	09/11/96 0231
CCV		960620AA	2.54416		2.5		101.8	% REC	09/11/96 0241
CCB		960729M	0.00132						09/11/96 0249
MD	962393-1		0.25889			0.25423	1.8	RPD	09/11/96 0307
CCV		960620AA	2.48675		2.5		99.5	% REC	09/11/96 0322
CCB		960729M	0.00199						09/11/96 0333
MS	962393-2	960630G	0.96364		1.000	0.11158	85.2	% REC	09/11/96 0335
PDS	962393-2	960630G	0.93146		1.000	0.02557	90.6	% REC	09/11/96 0339
CCV		960620AA	2.58955		2.5		103.6	% REC	09/11/96 0406
CCB		960729M	0.00199						09/11/96 0408
ISB		960630H	0.47123		0.5000		94.2	% REC	09/11/96 0425
CCV		960620AA	2.54172		2.5		101.7	% REC	09/11/96 0434
CCB		960729M	0.00332						09/11/96 0440



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Manganese (Mn)

Batch.....: 13084
Reporting Limit....: 0.01
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.02510		2.00		101.3	% REC	09/10/96 1133
ICB		960729M	-0.00024						09/10/96 1400
ISB		960630H	0.43339		0.5000		86.7	% REC	09/10/96 1422
CCV		960620AA	5.21200		5.0		104.2	% REC	09/10/96 1531
CCB		960729M	0.00099						09/10/96 1539
CCV		960620AA	5.14547		5.0		102.9	% REC	09/10/96 2225
CCB		960729M	-0.00050						09/10/96 2336
CCV		960620AA	5.19938		5.0		104.0	% REC	09/11/96 0017
CCB		960729M	0.00000						09/11/96 0033
MB		0910	0.00077						09/11/96 0054
LCS		960829H	1.00435		1.00		100.4	% REC	09/11/96 0100
MD	962447-1		0.03405			0.03380	0.00025	ABS Diff.	09/11/96 0109
MS	962447-2	960630G	0.99366		1.000	0.02674	96.7	% REC	09/11/96 0117
CCV		960620AA	5.13918		5.0		102.8	% REC	09/11/96 0129
CCB		960729M	-0.00151						09/11/96 0140
MB		0910	0.00076						09/11/96 0159
LCS		960829H	0.98041		1.00		98.0	% REC	09/11/96 0206
SB		960630G	0.97171		1.000		97.2	% REC	09/11/96 0220
MD	962419-3		0.34839			0.35036	0.6	RPD	09/11/96 0226
MS	962419-4	960630G	2.06648		1.000	1.10298	96.3	% REC	09/11/96 0231
CCV		960620AA	5.13263		5.0		102.7	% REC	09/11/96 0241
CCB		960729M	-0.00024						09/11/96 0249
MD	962393-1		9.41039			9.33738	0.8	RPD	09/11/96 0307
CCV		960620AA	5.05001		5.0		101.0	% REC	09/11/96 0322
CCB		960729M	-0.00000						09/11/96 0333
MS	962393-2	960630G	4.01826		1.000	3.28338	73.5	% REC	09/11/96 0335
PDS	962393-2	960630G	1.60476		1.000	0.69776	90.7	% REC	09/11/96 0339
CCV		960620AA	5.25126		5.0		105.0	% REC	09/11/96 0406
CCB		960729M	0.00151						09/11/96 0408
ISB		960630H	0.42829		0.5000		85.7	% REC	09/11/96 0425
CCV		960620AA	5.16460		5.0		103.3	% REC	09/11/96 0434
CCB		960729M	-0.00024						09/11/96 0440

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Molybdenum (Mo)

Batch.....: 13084
Reporting Limit....: 0.05
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	1.99219		2.00		99.6	% REC	09/10/96 1133
ICB		960729M	-0.00416						09/10/96 1400
ISB		960630H	0.93501		1.000		93.5	% REC	09/10/96 1422
CCV		960620AA	2.55092		2.5		102.0	% REC	09/10/96 1531
CCB		960729M	-0.00333						09/10/96 1539
CCV		960620AA	2.57113		2.5		102.8	% REC	09/10/96 2225
CCB		960729M	-0.00425						09/10/96 2336
CCV		960620AA	2.61632		2.5		104.7	% REC	09/11/96 0017
CCB		960729M	-0.00255						09/11/96 0033
MB		0910	-0.00422						09/11/96 0054
LCS		960829H	1.01063		1.00		101.1	% REC	09/11/96 0100
MD	962447-1		0.00091			0.00177	0.00086	ABS Diff.	09/11/96 0109
MS	962447-2	960630G	0.95631		1.000	-0.00248	95.9	% REC	09/11/96 0117



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 13084

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.05

Parameter.....: Molybdenum (Mo)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960620AA	2.56339		2.5		102.5	% REC	09/11/96 0129
CCB		960729M	-0.00170						09/11/96 0140
MB		0910	-0.00166						09/11/96 0159
LCS		960829H	0.96969		1.00		97.0	% REC	09/11/96 0206
SB		960630G	0.97074		1.000		97.1	% REC	09/11/96 0220
MD	962419-3		0.01095			0.01090	0.00005	ABS Diff.	09/11/96 0226
MS	962419-4	960630G	0.93769		1.000	0.00354	93.4	% REC	09/11/96 0231
CCV		960620AA	2.55147		2.5		102.1	% REC	09/11/96 0241
CCB		960729M	-0.00340						09/11/96 0249
MD	962393-1		0.33459			0.33288	0.5	RPD	09/11/96 0307
CCV		960620AA	2.48917		2.5		99.6	% REC	09/11/96 0322
CCB		960729M	-0.00170						09/11/96 0333
MS	962393-2	960630G	1.54249		1.000	0.67667	86.6	% REC	09/11/96 0335
CCV		960620AA	2.61291		2.5		104.5	% REC	09/11/96 0406
CCB		960729M	0.00000						09/11/96 0408
ISB		960630H	0.93410		1.000		93.4	% REC	09/11/96 0425
CCV		960620AA	2.53953		2.5		101.6	% REC	09/11/96 0434
I		960729M	-0.00340						09/11/96 0440

Test Method.....: SW-846 6010A

Batch.....: 13084

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.04

Parameter.....: Nickel (Ni)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.00389		2.00		100.2	% REC	09/10/96 1133
ICB		960729M	0.00406						09/10/96 1400
ISB		960630H	0.93531		1.000		93.5	% REC	09/10/96 1422
CCV		960620AA	2.59764		2.5		103.9	% REC	09/10/96 1531
CCB		960729M	-0.00179						09/10/96 1539
CCV		960620AA	2.54259		2.5		101.7	% REC	09/10/96 2225
CCB		960729M	0.00338						09/10/96 2336
CCV		960620AA	2.56311		2.5		102.5	% REC	09/11/96 0017
CCB		960729M	0.00630						09/11/96 0033
MB		0910	0.00002						09/11/96 0054
LCS		960829H	0.99155		1.00		99.2	% REC	09/11/96 0100
MD	962447-1		0.01106			0.01646	0.00540	ABS Diff.	09/11/96 0109
MS	962447-2	960630G	0.93790		1.000	0.00564	93.2	% REC	09/11/96 0117
CCV		960620AA	2.47268		2.5		98.9	% REC	09/11/96 0129
CCB		960729M	-0.00290						09/11/96 0140
MB		0910	0.01236						09/11/96 0159
LCS		960829H	0.96367		1.00		96.4	% REC	09/11/96 0206
SB		960630G	0.93624		1.000		93.6	% REC	09/11/96 0220
MD	962419-3		0.13548			0.13570	0.00022	ABS Diff.	09/11/96 0226
MS	962419-4	960630G	0.94161		1.000	0.04404	89.8	% REC	09/11/96 0231
CCV		960620AA	2.49749		2.5		99.9	% REC	09/11/96 0241
CCB		960729M	0.00632						09/11/96 0249
MD	962393-1		0.01870			0.01463	0.00407	ABS Diff.	09/11/96 0307
CCV		960620AA	2.43966		2.5		97.6	% REC	09/11/96 0322
CCB		960729M	0.00157						09/11/96 0333
	962393-2	960630G	0.86923		1.000	0.02114	84.8	% REC	09/11/96 0335
	962393-2	960630G	0.90330		1.000	0.00934	89.4	% REC	09/11/96 0339



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Nickel (Ni)

Batch.....: 13084
Reporting Limit....: 0.04
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960620AA	2.55926		2.5		102.4	% REC	09/11/96 0406
CCB		960729M	-0.00179						09/11/96 0408
ISB		960630H	0.90240		1.000		90.2	% REC	09/11/96 0425
CCV		960620AA	2.50075		2.5		100.0	% REC	09/11/96 0434
CCB		960729M	0.00518						09/11/96 0440

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Strontium (Sr)

Batch.....: 13084
Reporting Limit....: 0.01
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960412T	1.01972		1.00		102.0	% REC	09/10/96 1349
ICB		960729M	0.00020						09/10/96 1400
ISB		960630H	1.06316		1.0000		106.3	% REC	09/10/96 1422
CCV		960620AA	10.20308		10.0		102.0	% REC	09/10/96 1531
CCB		960729M	0.00202						09/10/96 1539
CCV		960620AA	10.03851		10.0		100.4	% REC	09/10/96 2225
CCB		960729M	0.00000						09/10/96 2336
CCV		960620AA	10.02814		10.0		100.3	% REC	09/11/96 0017
CCB		960729M	0.00040						09/11/96 0033
MB		0910	0.00325						09/11/96 0054
MD	962447-1		0.14485			0.14485	0.0	RPD	09/11/96 0109
MS	962447-2	960630G	1.07990		1.0000	0.14058	93.9	% REC	09/11/96 0117
CCV		960620AA	9.91055		10.0		99.1	% REC	09/11/96 0129
CCB		960729M	0.00020						09/11/96 0140
MB		0910	0.00325						09/11/96 0159
LCS		960412T	0.94337		1.00		94.3	% REC	09/11/96 0214
LCS		960412T	0.10009		0.100000		100.1	% REC	09/11/96 0217
SB		960630G	0.94604		1.0000		94.6	% REC	09/11/96 0220
MD	962419-3		1.34477			1.35047	0.4	RPD	09/11/96 0226
MS	962419-4	960630G	5.20620		1.0000	4.19078	101.5	% REC	09/11/96 0231
CCV		960620AA	9.99274		10.0		99.9	% REC	09/11/96 0241
CCB		960729M	0.00061						09/11/96 0249
MD	962393-1		3.58125			3.53812	1.2	RPD	09/11/96 0307
CCV		960620AA	9.80130		10.0		98.0	% REC	09/11/96 0322
CCB		960729M	0.00122						09/11/96 0333
MS	962393-2	960630G	3.13023		1.0000	2.34674	78.3	% REC	09/11/96 0335
PDS	962393-2	960630G	1.40806		1.0000	0.48196	92.6	% REC	09/11/96 0339
CCV		960620AA	10.22528		10.0		102.3	% REC	09/11/96 0406
CCB		960729M	0.00386						09/11/96 0408
ISB		960630H	1.05996		1.0000		106.0	% REC	09/11/96 0425
CCV		960620AA	10.16526		10.0		101.7	% REC	09/11/96 0434
CCB		960729M	0.00101						09/11/96 0440



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: EPA 150.1
Method Description.: pH
Parameter.....: pH

Batch.....: 13122
Reporting Limit....: 0.01
Units.....: pH Units

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		G960604A	4.03		4.00		100.8	% REC	09/11/96 1100
MD	962488-6		12.17			12.17	0.0	RPD	09/11/96 1100
CCV		960258	6.98		7.00		99.7	% REC	09/11/96 1100

Test Method.....: EPA 310.1
Method Description.: Alkalinity
Parameter.....: Alkalinity, Total as CaCO3

Batch.....: 13123
Reporting Limit....: 5
Units.....: mg/L CaCO3

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
MB			0						09/11/96 1100
LCS		G960725A	108		100		108.0	% REC	09/11/96 1100
MD	962419-11		920			910	1.1	RPD	09/11/96 1100

Test Method.....: EPA 353.2
Method Description.: Nitrogen, NO3 + NO2 (Auto Cd Red.)
Parameter.....: Nitrate + Nitrite as N

Batch.....: 13147
Reporting Limit....: 0.05
Units.....: mg/L

Analyst....: dne

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICL		G951016A	1.01		1.000000		101.0	% REC	09/11/96 0900
ICB			0.00						09/11/96 0906
MD	962474-1		1.80			1.76	2.2	RPD	09/11/96 0918
MS	962474-1	G951109	2.73		1.000000	1.76	97.0	% REC	09/11/96 0923
CCV		G951109	1.98		2.000000		99.0	% REC	09/11/96 1004
CCB			0.00						09/11/96 1010
MD	962419-2		0.07			0.06	0.01	ABS Diff.	09/11/96 1040
MS	962419-2	G951109	1.09		1.000000	0.06	103.0	% REC	09/11/96 1045
LCS		G951016A	0.97		1.000000		97.0	% REC	09/11/96 1057
CCV		G951109	1.97		2.000000		98.5	% REC	09/11/96 1103
CCB			0.00						09/11/96 1109
MD	962419-4		0.00			0.05	0.05	ABS Diff.	09/11/96 1120
MS	962419-4	G951109	0.99		1.000000	0.05	94.0	% REC	09/11/96 1126
CCV		G951109	1.96		2.000000		98.0	% REC	09/11/96 1207
CCB			0.00						09/11/96 1213
CCV		G951109	1.97		2.000000		98.5	% REC	09/11/96 1254
CCB			0.00						09/11/96 1300

Test Method.....: EPA 300.0
Method Description.: Ion Chromatography Analysis
Parameter.....: Sulfate (SO4)

Batch.....: 13161
Reporting Limit....: 10
Units.....: mg/L

Analyst....: dne

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICL		G960209A	48		50.0		96.0	% REC	09/12/96 1323
ICB			0						09/12/96 1410
MD	962498-1		19			19	0	ABS Diff.	09/12/96 1543
MS	962498-1	G960610A	42		25.000000	19	92.0	% REC	09/12/96 1629
		G960828A	102		100		102.0	% REC	09/12/96 1716
			0						09/12/96 1802



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: EPA 300.0

Method Description.: Ion Chromatography Analysis

Parameter.....: Sulfate (SO4)

Batch.....: 13161

Reporting Limit....: 10

Units.....: mg/L

Analyst....: dne

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		G960828A	101		100		101.0	% REC	09/12/96 2108
CCB			0						09/12/96 2155

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP Trace)

Parameter.....: Arsenic (As)

Batch.....: 13163

Reporting Limit....: 0.05

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.04608		2.00		102.3	% REC	09/12/96 2116
ICB		960729M	0.00100						09/12/96 2147
ISB		960630H	0.99446		1.000		99.4	% REC	09/12/96 2154
CCV		960809Z	2.58574		2.5		103.4	% REC	09/13/96 0010
CCB		960729M	0.00080						09/13/96 0014
MD	962419-5		0.00638			0.00597	0.00041	ABS Diff.	09/13/96 0054
PDS	962419-6	960630G	1.14664		1.000	0.08517	106.1	% REC	09/13/96 0100
CCV		960809Z	2.58315		2.5		103.3	% REC	09/13/96 0116
CCB		960729M	-0.00006						09/13/96 0133
MB		0912	-0.00117						09/13/96 0144
LCS		960912Z	1.02084		1.00		102.1	% REC	09/13/96 0147
MD	962439-1		0.00374			0.00036	0.00338	ABS Diff.	09/13/96 0156
MS	962439-2	960630G	0.98366		1.000	0.00017	98.3	% REC	09/13/96 0201
CCV		960809Z	2.43901		2.5		97.6	% REC	09/13/96 0210
CCB		960729M	0.00462						09/13/96 0216
CCV		960809Z	2.46441		2.5		98.6	% REC	09/13/96 0241
CCB		960729M	-0.00476						09/13/96 0245
ISB		960630H	1.02271		1.000		102.3	% REC	09/13/96 0254
CCV		960809Z	2.46039		2.5		98.4	% REC	09/13/96 0259
CCB		960729M	0.00330						09/13/96 0301

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP Trace)

Parameter.....: Beryllium (Be)

Batch.....: 13163

Reporting Limit....: 0.005

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.01472		2.00		100.7	% REC	09/12/96 2116
ICB		960729M	-0.00005						09/12/96 2147
ISB		960630H	0.48161		0.5000		96.3	% REC	09/12/96 2154
CCV		960809Z	2.54335		2.5		101.7	% REC	09/13/96 0010
CCB		960729M	0.00056						09/13/96 0014
MD	962419-5		0.00026			0.00031	0.00005	ABS Diff.	09/13/96 0054
PDS	962419-6	960630G	1.04486		1.000	0.00031	104.5	% REC	09/13/96 0100
CCV		960809Z	2.63572		2.5		105.4	% REC	09/13/96 0116
CCB		960729M	-0.00019						09/13/96 0133
MB		0912	-0.00024						09/13/96 0144
LCS		960912Z	1.04534		1.00		104.5	% REC	09/13/96 0147
MD	962439-1		-0.00038			-0.00028	0.00010	ABS Diff.	09/13/96 0156
MS	962439-2	960630G	1.02512		1.000	-0.00038	102.5	% REC	09/13/96 0201
CCV		960809Z	2.46279		2.5		98.5	% REC	09/13/96 0210
CCB		960729M	-0.00014						09/13/96 0216



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Beryllium (Be)

Batch.....: 13163
Reporting Limit...: 0.005
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960809Z	2.50223		2.5		100.1	% REC	09/13/96 0241
CCB		960729M	0.00000						09/13/96 0245
ISB		960630H	0.50746		0.5000		101.5	% REC	09/13/96 0254
CCV		960809Z	2.51429		2.5		100.6	% REC	09/13/96 0259
CCB		960729M	0.00014						09/13/96 0301

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Lead (Pb)

Batch.....: 13163
Reporting Limit...: 0.05
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	1.96374		2.00		98.2	% REC	09/12/96 2116
ICB		960729M	-0.00147						09/12/96 2147
ISB		960630H	1.03438		1.000		103.4	% REC	09/12/96 2154
CCV		960809Z	1.02303		1.0		102.3	% REC	09/13/96 0010
		960729M	-0.00277						09/13/96 0014
	962419-5		-0.00334			-0.00435	0.00101	ABS Diff.	09/13/96 0054
PDS	962419-6	960630G	1.10883		1.000	-0.00576	111.5	% REC	09/13/96 0100
CCV		960809Z	1.00791		1.0		100.8	% REC	09/13/96 0116
CCB		960729M	0.00072						09/13/96 0133
MB		0912	0.00272						09/13/96 0144
LCS		960912Z	1.02004		1.00		102.0	% REC	09/13/96 0147
MO	962439-1		0.00543			0.00421	0.00122	ABS Diff.	09/13/96 0156
MS	962439-2	960630G	1.02978		1.000	0.00122	102.9	% REC	09/13/96 0201
CCV		960809Z	0.96839		1.0		96.8	% REC	09/13/96 0210
CCB		960729M	0.00139						09/13/96 0216
CCV		960809Z	0.98764		1.0		98.8	% REC	09/13/96 0241
CCB		960729M	-0.00129						09/13/96 0245
ISB		960630H	1.03582		1.000		103.6	% REC	09/13/96 0254
CCV		960809Z	0.99681		1.0		99.7	% REC	09/13/96 0259
CCB		960729M	-0.00054						09/13/96 0301

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Selenium (Se)

Batch.....: 13163
Reporting Limit...: 0.1
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	1.98834		2.00		99.4	% REC	09/12/96 2116
ICB		960729M	0.00149						09/12/96 2147
ISB		960630H	0.95591		1.000		95.6	% REC	09/12/96 2154
CCV		960809Z	2.54290		2.5		101.7	% REC	09/13/96 0010
CCB		960729M	0.00181						09/13/96 0014
MD	962419-5		0.00515			0.00329	0.00186	ABS Diff.	09/13/96 0054
PDS	962419-6	960630G	1.11057		1.000	0.00431	110.6	% REC	09/13/96 0100
CCV		960809Z	2.57701		2.5		103.1	% REC	09/13/96 0116
CCB		960729M	0.00084						09/13/96 0133
MB		0912	0.00108						09/13/96 0144
		960912Z	0.97460		1.00		97.5	% REC	09/13/96 0147
	962439-1		-0.00033			0.00014	0.00047	ABS Diff.	09/13/96 0156



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLO IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Selenium (Se)

Batch.....: 13163
Reporting Limit....: 0.1
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
MS	962439-2	960630G	0.98784		1.000	-0.00352	99.1	% REC	09/13/96 0201
CCV		960809Z	2.39563		2.5		95.8	% REC	09/13/96 0210
CCB		960729M	0.00617						09/13/96 0216
CCV		960809Z	2.43816		2.5		97.5	% REC	09/13/96 0241
CCB		960729M	0.00116						09/13/96 0245
ISB		960630H	1.07921		1.000		107.9	% REC	09/13/96 0254
CCV		960809Z	2.44443		2.5		97.8	% REC	09/13/96 0259
CCB		960729M	0.00473						09/13/96 0301

Test Method.....: EPA 325.2
Method Description.: Chloride (Colorimetric, AA II)
Parameter.....: Chloride

Batch.....: 13172
Reporting Limit....: 0.5
Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICL		G960116A	48.54841		50.0		97.1	% REC	09/12/96 1430
LCS		G960116B	9.60388		10.0		96.0	% REC	09/12/96 1430
ICB			0.27194						09/12/96 1430
MD	962498-1		28.31274			28.35843	0.2	RPD	09/12/96 1430
MS	962498-1	G960506A	75.75848		50.000000	28.35843	94.8	% REC	09/12/96 1430
CCV		G960506E	79.62541		80.0		99.5	% REC	09/12/96 1430
CCB			0.27194						09/12/96 1430
LCS		G960116A	49.51346		50.0		99.0	% REC	09/12/96 1430
CCV		G960506E	78.30400		80.0		97.9	% REC	09/12/96 1430
CCB			0.27194						09/12/96 1430
MD	962452-3		11.54580			11.41034	1.2	RPD	09/12/96 1430
MS	962452-3	G960506A	59.73984		50.000000	11.41034	96.7	% REC	09/12/96 1430
CCV		G960506E	79.91460		80.0		99.9	% REC	09/12/96 1430
CCB			0.27194						09/12/96 1430
MD	962499-2		0.95409			1.40856	0.45447	ABS Diff.	09/12/96 1430
MS	962499-2	G960506A	48.06718		50.000000	1.40856	93.3	% REC	09/12/96 1430
LCS		G960116A	49.03049		50.0		98.1	% REC	09/12/96 1430
CCV		G960506E	78.01862		80.0		97.5	% REC	09/12/96 1430
CCB			0.27194						09/12/96 1430
CCV		G960506E	78.99164		80.0		98.7	% REC	09/12/96 1430
CCB			0.27194						09/12/96 1430
CCV		G960506E	78.87676		80.0		98.6	% REC	09/12/96 1430
CCB			0.27194						09/12/96 1430
CCV		G960506E	79.33692		80.0		99.2	% REC	09/12/96 1430
CCB			0.27194						09/12/96 1430

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Scandium (Sc)

Batch.....: 13175
Reporting Limit....: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960910M	1.87620		2.000		93.8	% REC	09/12/96 1021
ICB		960729M	0.00058						09/12/96 1040
ISB		960630H	1.07845		1.000		107.8	% REC	09/12/96 1055
MB		0911	0.00117						09/12/96 1111



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Scandium (Sc)

Batch.....: 13175
Reporting Limit...: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
EB		0910	0.00058						09/12/96 1117
SB		960630G	0.94735		1.000		94.7	% REC	09/12/96 1239
MS	962377-14	960630G	1.93985		2.000000	0.00058	97.0	% REC	09/12/96 1249
PDS	962377-14	960630G	0.91685		1.000	0.00058	91.6	% REC	09/12/96 1254
CCV		960620BB	2.30252		2.500		92.1	% REC	09/12/96 1304
CCB		960729M	0.00058						09/12/96 1324
CCV		960620BB	2.32569		2.500		93.0	% REC	09/12/96 1418
CCB		960729M	0.00058						09/12/96 1424
ED	962377-24		0.00058			0.00058	0.00000	ABS Diff.	09/12/96 1432
MD	962377-34		0.00146			0.00058	0.00088	ABS Diff.	09/12/96 1451
EB		0911	0.00058						09/12/96 1504
SB		960630G	0.99074		1.000		99.1	% REC	09/12/96 1507
MS	962377-5	960630G	1.00277		1.000	0.00088	100.2	% REC	09/12/96 1517
CCV		960620BB	2.30340		2.500		92.1	% REC	09/12/96 1522
CCB		960729M	0.00058						09/12/96 1529
PDS	962377-5	960630G	0.91158		1.000	0.00088	91.1	% REC	09/12/96 1539
ED	962377-25		0.00088			0.00088	0.00000	ABS Diff.	09/12/96 1551
MD	962377-25		0.00088			0.00088	0.00000	ABS Diff.	09/12/96 1554
CCV		960620BB	2.27701		2.500		91.1	% REC	09/12/96 1612
CCB		960729M	0.00058						09/12/96 1619
MD	962419-2		0.00175			0.00205	0.00030	ABS Diff.	09/12/96 1625
PDS	962419-5	960630G	1.00363		1.000	0.00058	100.3	% REC	09/12/96 1631
ISB		960630H	1.01132		1.000		101.1	% REC	09/12/96 1749
CCV		960620BB	2.34299		2.500		93.7	% REC	09/12/96 1752
CCB		960729M	0.00000						09/12/96 1759
MB		0911	0.00029						09/12/96 1842
EB		0907	0.00000						09/12/96 1848
SB		960630G	0.99573		1.000		99.6	% REC	09/12/96 1850
ED	962377-23		0.00000			0.00000	0	ABS Diff.	09/12/96 1914
MD	962377-33		0.00000			0.00000	0	ABS Diff.	09/12/96 1919
CCV		960620BB	2.25678		2.500		90.3	% REC	09/12/96 1922
CCB		960729M	0.00000						09/12/96 1937
MS	962377-43	960630G	1.00365		1.000	0.00000	100.4	% REC	09/12/96 1944
PDS	962377-43	960630G	1.01010		1.000	0.00000	101.0	% REC	09/12/96 1952
EB		0910	0.00000						09/12/96 1959
SB		960630G	0.97256		1.000		97.3	% REC	09/12/96 2005
MS	962376-2	960630G	1.00218		1.000	0.00117	100.1	% REC	09/12/96 2011
PDS	962376-2	960630G	1.05730		1.000	0.00117	105.6	% REC	09/12/96 2021
CCV		960620BB	2.46451		2.500		98.6	% REC	09/12/96 2027
CCB		960729M	0.00000						09/12/96 2040
ED	962376-4		0.00000			0.00000	0	ABS Diff.	09/12/96 2059
MD	962376-4		0.00000			0.00000	0	ABS Diff.	09/12/96 2102
CCV		960620BB	2.44628		2.500		97.9	% REC	09/12/96 2139
CCB		960729M	0.00032						09/12/96 2147
CCV		960620BB	2.41991		2.500		96.8	% REC	09/12/96 2337
CCB		960729M	0.00032						09/12/96 2348
ISB		960630H	1.11773		1.000		111.8	% REC	09/12/96 2356
CCV		960620BB	2.46939		2.500		98.8	% REC	09/13/96 0013
CCB		960729M	0.00000						09/13/96 0019



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 7470
Method Description.: Mercury (CVAA)
Parameter.....: Mercury (Hg)

Batch.....: 13181
Reporting Limit....: 0.0002
Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960624G	0.003884		0.004000		97.1	% REC	09/13/96 0930
ICB		09136	0.000149						09/13/96 0931
MB		0912	0.000149						09/13/96 0932
MD	962419-3		0.000149			0.000149	0.00000	ABS Diff.	09/13/96 0936
MS	962477-1	950929N	0.005129		0.005000	0.000149	99.6	% REC	09/13/96 0938
CCV		950929N	0.005212		0.005000		104.2	% REC	09/13/96 0944
CCB		09136	0.000149						09/13/96 0945
MB		0912	0.000149						09/13/96 0946
EB		1311	0.000149						09/13/96 0947
ED	962291-1		0.000149			0.000149	0.00000	ABS Diff.	09/13/96 0950
MD	962291-1		0.000149			0.000149	0.00000	ABS Diff.	09/13/96 0951
MS	962368-3	950929N	0.004922		0.005000	0.000149	95.5	% REC	09/13/96 0953
EB		1311	0.000149						09/13/96 0955
SB		950929N	0.005088		0.005000		101.8	% REC	09/13/96 0957
CCV		950929N	0.005005		0.005000		100.1	% REC	09/13/96 0958
CCB		09136	0.000149						09/13/96 0959
SB		950929N	0.005171		0.005000		103.4	% REC	09/13/96 1000
ED	962372-1		0.000149			0.000149	0.00000	ABS Diff.	09/13/96 1002
MD	962372-1		0.000149			0.000149	0.00000	ABS Diff.	09/13/96 1003
MS	962416-3	950929N	0.005005		0.005000	0.000190	96.3	% REC	09/13/96 1006
MSD	962416-3	950929N	0.005296	0.00500	0.005000	0.000190	102.1	% REC	09/13/96 1007
							5.6	RPD	
EB		1311	0.000149						09/13/96 1008
SB		950929N	0.004797		0.005000		95.9	% REC	09/13/96 1009
CCV		950929N	0.005379		0.005000		107.6	% REC	09/13/96 1012
CCB		09136	0.000149						09/13/96 1013
MS	962438-1	950929N	0.005254		0.005000	0.000149	102.1	% REC	09/13/96 1015
MS	962463-1	950929N	0.004922		0.005000	0.000190	94.6	% REC	09/13/96 1020
ED	962468-3		0.000149			0.000149	0.00000	ABS Diff.	09/13/96 1024
CCV		950929N	0.004797		0.005000		95.9	% REC	09/13/96 1025
CCB		09136	0.000149						09/13/96 1027
MD	962468-3		0.000149			0.000149	0.00000	ABS Diff.	09/13/96 1028
CCV		950929N	0.004922		0.005000		98.4	% REC	09/13/96 1029
CCB		09136	0.000149						09/13/96 1030

Test Method.....: SW-846 7041
Method Description.: Antimony (GFAA)
Parameter.....: Antimony (Sb)

Batch.....: 13194
Reporting Limit....: 0.002
Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960911B	0.04071		0.0400		101.8	% REC	09/11/96 1155
ICB		09116	-0.00024						09/11/96 1204
MB		0906	0.00054						09/11/96 1214
EB		1320	0.00033						09/11/96 1218
SB		960624L	0.02191		0.020000		109.5	% REC	09/11/96 1222
SD	962377-1		0.00174			0.00053		% Diff.	09/11/96 1229
MS	962377-11	960624L	0.01845		0.020000	0.00081	88.2	% REC	09/11/96 1237
ED	962377-21		0.00020			0.00043	0.00023	ABS Diff.	09/11/96 1249
CCV		960911C	0.05298		0.050		106.0	% REC	09/11/96 1252
CCB		09116	0.00004						09/11/96 1256
EB		1320	0.00061						09/11/96 1311



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 7041

Method Description.: Antimony (GFAA)

Parameter.....: Antimony (Sb)

Batch.....: 13194

Reporting Limit....: 0.002

Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
SB		960624L	0.00201		0.020000		10.1	% REC	09/11/96 1316
MS	962377-2	960624L	0.01949		0.020000	0.00058	94.5	% REC	09/11/96 1323
MD	962377-22		0.00084			0.00120	0.00036	ABS Diff.	09/11/96 1335
CCV		960911C	0.05258		0.050		105.2	% REC	09/11/96 1339
CCB		09116	0.00091						09/11/96 1343
ED	962377-22		0.00058			0.00120	0.00062	ABS Diff.	09/11/96 1346
MB		0910	-0.00025						09/11/96 1402
EB		1320	-0.00100						09/11/96 1411
SB		960624L	0.00123		0.020000		6.2	% REC	09/11/96 1415
MS	962377-13	960624L	0.01754		0.020000	0.00058	84.8	% REC	09/11/96 1427
CCV		960911C	0.05269		0.050		105.4	% REC	09/11/96 1430
CCB		09116	0.00027						09/11/96 1434
ED	962377-23		0.00071			0.00099	0.00028	ABS Diff.	09/11/96 1442
MD	962377-33		-0.00016			0.00152	0.00168	ABS Diff.	09/11/96 1450
CCV		960911C	0.05291		0.050		105.8	% REC	09/11/96 1610
CCB		09116	-0.00199						09/11/96 1614
SB		1320	0.00106						09/11/96 1618
		960624L	0.00049		0.020000		2.5	% REC	09/11/96 1621
	962377-4	960624L	0.01944		0.020000	-0.00049	99.7	% REC	09/11/96 1629
SD	962377-14		0.00068			0.00040		% Diff.	09/11/96 1637
ED	962377-24		0.00044			0.00070	0.00026	ABS Diff.	09/11/96 1644
MD	962377-24		0.00219			0.00070	0.00149	ABS Diff.	09/11/96 1648
CCV		960911C	0.05357		0.050		107.1	% REC	09/11/96 1656
CCB		09116	0.00114						09/11/96 1700
EB		1312	0.00080						09/11/96 1713
SB		960624L	0.00095		0.020000		4.8	% REC	09/11/96 1717
MS	962376-2	960624L	0.02012		0.020000	0.00014	99.9	% REC	09/11/96 1724
ED	962376-4		0.00156			0.00061	0.00095	ABS Diff.	09/11/96 1732
MD	962376-4		0.00004			0.00061	0.00057	ABS Diff.	09/11/96 1736
CCV		960911C	0.05302		0.050		106.0	% REC	09/11/96 1744
CCB		09116	0.00024						09/11/96 1747
CCV		960911C	0.05296		0.050		105.9	% REC	09/11/96 1755
CCB		09116	0.00091						09/11/96 1759
CCV		960911C	0.05384		0.050		107.7	% REC	09/11/96 1902
CCB		09116	0.00108						09/11/96 1906
SB		960624L	0.02169		0.020000		108.5	% REC	09/11/96 1910
SB		960624L	0.02097		0.020000		104.8	% REC	09/11/96 1914
MD	962419-1		0.00132			-0.00059	0.00191	ABS Diff.	09/11/96 1921
PDS	962419-5	960716G	0.01882		0.020000	0.00108	88.7	% REC	09/11/96 1933
SD	962419-6		0.00073			0.00047		% Diff.	09/11/96 1941
CCV		960911C	0.05328		0.050		106.6	% REC	09/11/96 1948
CCB		09116	0.00054						09/11/96 1952

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP)

Parameter.....: Aluminum (Al)

Batch.....: 13222

Reporting Limit....: 0.02

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960501Q	0.97822		1.00		97.8	% REC	09/13/96 1748
		960729M	0.00528						09/13/96 1803
		960323A	525.31384		500		105.1	% REC	09/13/96 1805



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Aluminum (Al)

Batch.....: 13222
Reporting Limit...: 0.02
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ISB		960630H	496.44787		500		99.3	% REC	09/13/96 1808
MB		0910	0.00793						09/13/96 1849
CCV		960620AA	10.03339		10.0		100.3	% REC	09/13/96 1856
CCB		960729M	-0.00233						09/13/96 1906
LCS		960829H	1.02209		1.00		102.2	% REC	09/13/96 1910
MD	962419-3		0.34370			0.32143	6.7	RPD	09/13/96 1917
MS	962419-4	960630G	3.48712		2.0000	1.37166	105.8	% REC	09/13/96 1921
PDS	962419-4	960630G	3.36953		2.0000	1.37166	99.9	% REC	09/13/96 1928
CCV		960620AA	9.95631		10.0		99.6	% REC	09/13/96 1940
CCB		960729M	0.01301						09/13/96 1942
ISA		960323A	525.22406		500		105.0	% REC	09/13/96 1946
ISB		960630H	501.49896		500		100.3	% REC	09/13/96 1950
CCV		960620AA	9.92922		10.0		99.3	% REC	09/13/96 1958
CCB		960729M	0.00232						09/13/96 2007

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Boron (B)

Batch.....: 13222
Reporting Limit...: 0.05
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960501Q	0.99237		1.00		99.2	% REC	09/13/96 1748
ICB		960729M	0.00565						09/13/96 1803
ISB		960630H	1.01941		1.000		101.9	% REC	09/13/96 1808
MB		0910	0.00627						09/13/96 1849
CCV		960620AA	2.53087		2.5		101.2	% REC	09/13/96 1856
CCB		960729M	0.00424						09/13/96 1906
LCS		960829H	1.07301		1.00		107.3	% REC	09/13/96 1910
MD	962419-3		3.31879			3.29341	0.8	RPD	09/13/96 1917
MS	962419-4	960630G	1.52173		1.000	0.53043	99.1	% REC	09/13/96 1921
PDS	962419-4	960630G	1.53475		1.000	0.53043	100.4	% REC	09/13/96 1928
CCV		960620AA	2.48443		2.5		99.4	% REC	09/13/96 1940
CCB		960729M	0.00849						09/13/96 1942
ISB		960630H	1.04663		1.000		104.7	% REC	09/13/96 1950
CCV		960620AA	2.51457		2.5		100.6	% REC	09/13/96 1958
CCB		960729M	0.00565						09/13/96 2007

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Titanium (Ti)

Batch.....: 13222
Reporting Limit...: 0.01
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	1.99480		2.00		99.7	% REC	09/13/96 1745
ICB		960729M	-0.00166						09/13/96 1803
ISB		960630H	1.01987		1.000		102.0	% REC	09/13/96 1808
MB		0910	0.00054						09/13/96 1849
CCV		960620AA	2.51448		2.5		100.6	% REC	09/13/96 1856
CCB		960729M	-0.00164						09/13/96 1906
LCS		960829H	1.00362		1.00		100.4	% REC	09/13/96 191
MD	962419-3		0.00775			0.00644	0.00131	ABS Diff.	09/13/96 191



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 13222

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.01

Parameter.....: Titanium (Ti)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
MS	962419-4	960630G	0.98825		1.000	0.00591	98.2	% REC	09/13/96 1921
PDS	962419-4	960630G	1.01315		1.000	0.00591	100.7	% REC	09/13/96 1928
CCV		960620AA	2.47607		2.5		99.0	% REC	09/13/96 1940
CCB		960729M	0.00005						09/13/96 1942
ISB		960630H	1.03887		1.000		103.9	% REC	09/13/96 1950
CCV		960620AA	2.48284		2.5		99.3	% REC	09/13/96 1958
CCB		960729M	-0.00163						09/13/96 2007

Test Method.....: SW-846 6010A

Batch.....: 13222

Analyst....: smh

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.05

Parameter.....: Vanadium (V)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.01032		2.00		100.5	% REC	09/13/96 1745
ICB		960729M	-0.00158						09/13/96 1803
		960630H	0.47646		0.5000		95.3	% REC	09/13/96 1808
		0910	-0.00235						09/13/96 1849
CCV		960620AA	2.53793		2.5		101.5	% REC	09/13/96 1856
CCB		960729M	-0.00186						09/13/96 1906
LCS		960829H	1.01017		1.00		101.0	% REC	09/13/96 1910
MD	962419-3		0.00181			0.00183	0.00002	ABS Diff.	09/13/96 1917
MS	962419-4	960630G	1.00335		1.000	0.01617	98.7	% REC	09/13/96 1921
PDS	962419-4	960630G	1.03097		1.000	0.01617	101.5	% REC	09/13/96 1928
CCV		960620AA	2.48546		2.5		99.4	% REC	09/13/96 1940
CCB		960729M	-0.00186						09/13/96 1942
ISB		960630H	0.49780		0.5000		99.6	% REC	09/13/96 1950
CCV		960620AA	2.52060		2.5		100.8	% REC	09/13/96 1958
CCB		960729M	-0.00172						09/13/96 2007

Test Method.....: SW-846 7041

Batch.....: 13239

Analyst....: lmt

Method Description.: Antimony (GFAA)

Reporting Limit....: 0.002

Parameter.....: Antimony (Sb)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960911B	0.04290		0.0400		107.2	% REC	09/13/96 1006
ICB		09136	0.00009						09/13/96 1013
MB		0906	-0.00017						09/13/96 1131
LCS		960829H	0.04328		0.040000		108.2	% REC	09/13/96 1135
CCV		960911C	0.05247		0.050		104.9	% REC	09/13/96 1139
CCB		09136	0.00142						09/13/96 1143
MS	962442-1	960624L	0.01799		0.020000	-0.00048	92.3	% REC	09/13/96 1151
MD	962422-3		0.00108			-0.00006	0.00114	ABS Diff.	09/13/96 1158
SD	962422-3		0.00104			-0.00006		% Diff.	09/13/96 1202
CCV		960911C	0.05141		0.050		102.8	% REC	09/13/96 1210
CCB		09136	0.00025						09/13/96 1214
CCV		960911C	0.05322		0.050		106.4	% REC	09/13/96 1254
CCB		09136	-0.00051						09/13/96 1258
		960911C	0.05407		0.050		108.1	% REC	09/13/96 1344
		09136	0.00027						09/13/96 1347



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 7041

Method Description.: Antimony (GFAA)

Parameter.....: Antimony (Sb)

Batch.....: 13239

Reporting Limit....: 0.002

Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
SD	962419-9		0.00063			0.05407		% Diff.	09/13/96 1355
MD	962419-10		0.00162			0.00162	0.00000	ABS Diff.	09/13/96 1403
CCV		960911C	0.05358		0.050		107.2	% REC	09/13/96 1407
CCB		09136	0.00001						09/13/96 1411
CCV		960911C	0.05282		0.050		105.6	% REC	09/13/96 1424
CCB		09136	-0.00006						09/13/96 1428
PDS	962419-9	960716G	0.01615		0.020000	-0.00064	84.0	% REC	09/13/96 1446
CCV		960911C	0.05283		0.050		105.7	% REC	09/13/96 1450
CCB		09136	0.00161						09/13/96 1454

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP Trace)

Parameter.....: Arsenic (As)

Batch.....: 13274

Reporting Limit....: 0.05

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.05975		2.00		103.0	% REC	09/16/96 1702
ICB		960729M	0.00153						09/16/96 1817
ISB		960630H	1.01926		1.000		101.9	% REC	09/16/96 1830
CCV		960809Z	2.62364		2.5		104.9	% REC	09/16/96 2104
CCB		960729M	-0.00302						09/16/96 2215
MB		0916	-0.00236						09/16/96 2349
LCS		960912Z	1.04650		1.00		104.7	% REC	09/16/96 2355
MD	962419-7		0.11095			0.10721	0.00374	ABS Diff.	09/17/96 0017
CCV		960809Z	2.59613		2.5		103.8	% REC	09/17/96 0030
CCB		960729M	-0.00026						09/17/96 0039
MS	962419-11	960630G	0.94716		1.000	0.00296	94.4	% REC	09/17/96 0046
MB		0910	-0.00429						09/17/96 0214
LCS		960829H	0.98937		1.00		98.9	% REC	09/17/96 0217
MD	962393-1		-0.00279			-0.00032	0.00247	ABS Diff.	09/17/96 0247
CCV		960809Z	2.54804		2.5		101.9	% REC	09/17/96 0257
CCB		960729M	-0.00201						09/17/96 0305
MS	962393-2	960630G	0.94813		1.000	0.00907	93.9	% REC	09/17/96 0314
ISB		960630H	1.01777		1.000		101.8	% REC	09/17/96 0332
CCV		960809Z	2.56486		2.5		102.6	% REC	09/17/96 0351
CCB		960729M	-0.00302						09/17/96 0354

Test Method.....: SW-846 6010A

Method Description.: Metals Analysis (ICAP Trace)

Parameter.....: Beryllium (Be)

Batch.....: 13274

Reporting Limit....: 0.005

Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.03353		2.00		101.7	% REC	09/16/96 1702
ICB		960729M	-0.00006						09/16/96 1817
ISB		960630H	0.50578		0.5000		101.2	% REC	09/16/96 1830
CCV		960809Z	2.63584		2.5		105.4	% REC	09/16/96 2104
CCB		960729M	0.00079						09/16/96 2215
MB		0916	0.00067						09/16/96 2349
LCS		960912Z	1.04745		1.00		104.7	% REC	09/16/96 2355
MD	962419-7		0.00201			0.00207	0.00006	ABS Diff.	09/17/96 0017



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 13274

Analyst....: smh

Method Description.: Metals Analysis (ICAP Trace)

Reporting Limit...: 0.005

Parameter.....: Beryllium (Be)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960809Z	2.64521		2.5		105.8	% REC	09/17/96 0030
CCB		960729M	0.00067						09/17/96 0039
MS	962419-11	960630G	0.99296		1.000	0.00073	99.2	% REC	09/17/96 0046
MB		0910	0.00092						09/17/96 0214
LCS		960829H	1.02464		1.00		102.5	% REC	09/17/96 0217
MD	962393-1		0.00073			0.00067	0.00006	ABS Diff.	09/17/96 0247
CCV		960809Z	2.59830		2.5		103.9	% REC	09/17/96 0257
CCB		960729M	-0.00005						09/17/96 0305
MS	962393-2	960630G	0.98157		1.000	-0.00012	98.2	% REC	09/17/96 0314
ISB		960630H	0.52505		0.5000		105.0	% REC	09/17/96 0332
CCV		960809Z	2.61765		2.5		104.7	% REC	09/17/96 0351
CCB		960729M	0.00018						09/17/96 0354

Test Method.....: SW-846 6010A

Batch.....: 13274

Analyst....: smh

Method Description.: Metals Analysis (ICAP Trace)

Reporting Limit...: 0.05

Parameter.....: Lead (Pb)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.01817		2.00		100.9	% REC	09/16/96 1702
ICB		960729M	0.00086						09/16/96 1817
ISB		960630H	1.15411		1.000		115.4	% REC	09/16/96 1830
CCV		960809Z	1.04359		1.0		104.4	% REC	09/16/96 2104
CCB		960729M	-0.00112						09/16/96 2215
MB		0916	-0.00060						09/16/96 2349
LCS		960912Z	1.02069		1.00		102.1	% REC	09/16/96 2355
MD	962419-7		0.01987			0.02388	0.00401	ABS Diff.	09/17/96 0017
CCV		960809Z	1.02959		1.0		103.0	% REC	09/17/96 0030
CCB		960729M	-0.00059						09/17/96 0039
MS	962419-11	960630G	1.05400		1.000	0.00803	104.6	% REC	09/17/96 0046
MB		0910	0.00106						09/17/96 0214
LCS		960829H	0.98794		1.00		98.8	% REC	09/17/96 0217
MD	962393-1		-0.00156			0.00009	0.00165	ABS Diff.	09/17/96 0247
CCV		960809Z	1.01223		1.0		101.2	% REC	09/17/96 0257
CCB		960729M	-0.00169						09/17/96 0305
MS	962393-2	960630G	1.06861		1.000	0.00549	106.3	% REC	09/17/96 0314
ISB		960630H	1.13297		1.000		113.3	% REC	09/17/96 0332
CCV		960809Z	1.03158		1.0		103.2	% REC	09/17/96 0351
CCB		960729M	-0.00125						09/17/96 0354

Test Method.....: SW-846 6010A

Batch.....: 13274

Analyst....: smh

Method Description.: Metals Analysis (ICAP Trace)

Reporting Limit...: 0.1

Parameter.....: Selenium (Se)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960716T	2.03596		2.00		101.8	% REC	09/16/96 1702
ICB		960729M	-0.00112						09/16/96 1817
ISB		960630H	1.01991		1.000		102.0	% REC	09/16/96 1830
		960809Z	2.55585		2.5		102.2	% REC	09/16/96 2104
		960729M	-0.00156						09/16/96 2215



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP Trace)
Parameter.....: Selenium (Se)

Batch.....: 13274
Reporting Limit....: 0.1
Units.....: mg/L

Analyst....: smh

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
MB		0916	0.00457						09/16/96 2349
LCS		960912Z	0.97230		1.00		97.2	% REC	09/16/96 2355
MD	962419-7		0.00240			0.00241	0.00001	ABS Diff.	09/17/96 0017
CCV		960809Z	2.56545		2.5		102.6	% REC	09/17/96 0030
CCB		960729M	0.00665						09/17/96 0039
MS	962419-11	960630G	0.95048		1.000	-0.01321	96.4	% REC	09/17/96 0046
MB		0910	0.00330						09/17/96 0214
LCS		960829H	0.92589		1.00		92.6	% REC	09/17/96 0217
MD	962393-1		-0.00891			-0.00898	0.00007	ABS Diff.	09/17/96 0247
CCV		960809Z	2.52598		2.5		101.0	% REC	09/17/96 0257
CCB		960729M	0.00448						09/17/96 0305
MS	962393-2	960630G	0.94603		1.000	0.00158	94.4	% REC	09/17/96 0314
ISB		960630H	1.01116		1.000		101.1	% REC	09/17/96 0332
CCV		960809Z	2.51647		2.5		100.7	% REC	09/17/96 0351
CCB		960729M	0.00629						09/17/96 0354

Test Method.....: EPA 375.2
Method Description.: Sulfate (Automated MTB, AAIL)
Parameter.....: Sulfate (S04)

Batch.....: 13275
Reporting Limit....: 10.
Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICL		G951103A	49.72515		50.0		99.5	% REC	09/16/96 1100
ICB			-0.23617						09/16/96 1100
MD	962115-41		5.24234			8.53630	3.29396	ABS Diff.	09/16/96 1100
MS	962115-41	G960610A	54.73843		50.000000	8.53630	92.4	% REC	09/16/96 1100
CCV		G960415E	77.44154		80		96.8	% REC	09/16/96 1100
CCB			-0.23617						09/16/96 1100
ED	962415-1		184.3973			171.95426	7.0	RPD	09/16/96 1100
LCS		G951103A	47.16711		50.0		94.3	% REC	09/16/96 1100
CCV		G960415E	76.36214		80		95.5	% REC	09/16/96 1100
CCB			-0.23617						09/16/96 1100
MD	962115-42		1.93937			2.69514	0.75577	ABS Diff.	09/16/96 1100
MS	962115-42	G960610A	51.73226		50.000000	2.69514	98.1	% REC	09/16/96 1100
CCV		G960415E	78.61024		80		98.3	% REC	09/16/96 1100
CCB			-0.23617						09/16/96 1100
CCV		G960415E	73.93144		80		92.4	% REC	09/16/96 1100
CCB			-0.23617						09/16/96 1100
CCV		G960415E	77.26167		80		96.6	% REC	09/16/96 1100
CCB			-0.23617						09/16/96 1100
CCV		G960415E	74.02151		80		92.5	% REC	09/16/96 1100
CCB			0.61561						09/16/96 1100

Test Method.....: SW-846 7841
Method Description.: Thallium (GFAA)
Parameter.....: Thallium (Tl)

Batch.....: 13283
Reporting Limit....: 0.005
Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960722B	0.03984		0.0400		99.6	% REC	09/16/96 1032
ICB		09166	-0.00067						09/16/96 1037



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 7841

Method Description.: Thallium (GFAA)

Parameter.....: Thallium (Tl)

Batch.....: 13283

Reporting Limit....: 0.005

Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960722C	0.04988		0.050		99.8	% REC	09/16/96 1138
CCB		09166	-0.00053						09/16/96 1204
CCV		960722C	0.04819		0.050		96.4	% REC	09/16/96 1226
CCB		09166	-0.00030						09/16/96 1232
MB		0914	-0.00027						09/16/96 1251
LCS		960912Z	0.03711		0.040000		92.8	% REC	09/16/96 1254
MD	962419-3		-0.00020			-0.00042	0.00022	ABS Diff.	09/16/96 1300
MS	962419-4	960624L	0.01951		0.020000	-0.00046	99.8	% REC	09/16/96 1306
SD	962419-11		0.00128			0.00042		% Diff.	09/16/96 1314
CCV		960722C	0.05060		0.050		101.2	% REC	09/16/96 1320
CCB		09166	0.00048						09/16/96 1323

Test Method.....: ASTM 3111B

Method Description.: Bismuth & Gallium (FLAA)

Parameter.....: Bismuth (Bi)

Batch.....: 13328

Reporting Limit....: 1

Units.....: mg/L

Analyst....: lmt

	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		951219D	20.39		20.04		101.7	% REC	09/17/96 1540
ICB		09176	-0.19						09/17/96 1540
MB		0916	0.16						09/17/96 1541
SB		950727	10.8		10.020000		107.8	% REC	09/17/96 1541
MD	962419-7		-0.04			-0.01	0.03	ABS Diff.	09/17/96 1543
MS	962419-11	950727	9.77		10.020000	0.05	97.0	% REC	09/17/96 1543
MB		0917	0.05						09/17/96 1544
CCV		960909G	25.61		25.000000		102.4	% REC	09/17/96 1544
CCB		09176	0.19						09/17/96 1545
EB		1320	0.20						09/17/96 1545
SB		950727	20.98		20.040000		104.7	% REC	09/17/96 1545
MD	962377-26		0.08			-0.67	0.75	ABS Diff.	09/17/96 1547
ED	962377-26		-0.02			-0.67	0.65	ABS Diff.	09/17/96 1547
MS	962377-36	950727	22.04		20.040000	-0.16	110.8	% REC	09/17/96 1548
CCV		960909G	25.95		25.000000		103.8	% REC	09/17/96 1549
CCB		09176	-0.18						09/17/96 1549
EB		1320	0.79						09/17/96 1550
SB		950727	19.37		20.040000		96.7	% REC	09/17/96 1550
MD	962377-7		-0.13			-0.41	0.28	ABS Diff.	09/17/96 1551
MS	962377-17	950727	21.47		20.040000	-0.40	109.1	% REC	09/17/96 1552
EO	962377-27		-0.56			0.00	0.56	ABS Diff.	09/17/96 1552
CCV		960909G	25.78		25.000000		103.1	% REC	09/17/96 1553
CCB		09176	0.04						09/17/96 1553
MB		0917	-0.61						09/17/96 1555
EB		1320	-0.59						09/17/96 1555
SB		950727	19.34		20.040000		96.5	% REC	09/17/96 1555
MD	962377-8		-0.84			-0.70	0.14	ABS Diff.	09/17/96 1556
MS	962377-18	950727	20.38		20.040000	0.01	101.6	% REC	09/17/96 1557
CCV		960909G	25.89		25.000000		103.6	% REC	09/17/96 1557
CCB		09176	0.45						09/17/96 1557
ED	962377-28		-0.02			0.49	0.51	ABS Diff.	09/17/96 1558
CCV		960909G	25.62		25.000000		102.5	% REC	09/17/96 1600
3		09176	0.01						09/17/96 1600



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: ASTM 3111B
Method Description.: Bismuth & Gallium (FLAA)
Parameter.....: Gallium (Ga)

Batch.....: 13330
Reporting Limit....: 0.5
Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		951219D	19.97		20.12		99.3	% REC	09/17/96 1630
ICB		09176	0.28						09/17/96 1630
MB		0916	0.17						09/17/96 1631
SB		950729	11.01		10.060000		109.4	% REC	09/17/96 1631
MD	962419-7		-0.04			0.02	0.06	ABS Diff.	09/17/96 1632
MS	962419-11	950729	10.96		10.060000	-0.19	110.8	% REC	09/17/96 1633
SD	962419-11		-0.39			-0.19		% Diff.	09/17/96 1634
MB		0917	-0.27						09/17/96 1634
CCV		960909G	24.95		25.000000		99.8	% REC	09/17/96 1634
CCB		09176	-0.21						09/17/96 1635
EB		1320	0.01						09/17/96 1635
SB		950729	20.66		20.120000		102.7	% REC	09/17/96 1635
MD	962377-26		-0.28			-0.27	0.01	ABS Diff.	09/17/96 1637
ED	962377-26		-0.03			-0.27	0.24	ABS Diff.	09/17/96 1637
MS	962377-36	950729	21.40		20.120000	-0.07	106.7	% REC	09/17/96 1638
CCV		960909G	25.06		25.000000		100.2	% REC	09/17/96 1639
CCB		09176	-0.39						09/17/96 1639
EB		1320	-0.04						09/17/96 1640
SB		950729	19.24		20.120000		95.6	% REC	09/17/96 1640
SD	962377-7		-0.34			-0.11		% Diff.	09/17/96 1641
MD	962377-7		-0.18			-0.11	0.07	ABS Diff.	09/17/96 1641
MS	962377-17	950729	21.23		20.120000	-0.39	107.5	% REC	09/17/96 1642
ED	962377-27		0.12			-0.39	0.51	ABS Diff.	09/17/96 1642
CCV		960909G	25.13		25.000000		100.5	% REC	09/17/96 1643
CCB		09176	-0.01						09/17/96 1643
MB		0917	-0.31						09/17/96 1645
EB		1320	-0.40						09/17/96 1645
SB		950729	19.18		20.120000		95.3	% REC	09/17/96 1645
MD	962377-8		0.13			-0.42	0.55	ABS Diff.	09/17/96 1646
MS	962377-18	950729	19.77		20.120000	0.04	98.1	% REC	09/17/96 1647
CCV		960909G	24.78		25.000000		99.1	% REC	09/17/96 1647
CCB		09176	0.23						09/17/96 1647
ED	962377-28		-0.31			-0.22	0.09	ABS Diff.	09/17/96 1648
CCV		960909G	24.86		25.000000		99.4	% REC	09/17/96 1650
CCB		09176	-0.10						09/17/96 1650

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Lithium (Li)

Batch.....: 13334
Reporting Limit....: 0.01
Units.....: mg/L

Analyst....: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960910M	1.89639		2.000		94.8	% REC	09/17/96 1045
ICB		960729M	0.00334						09/17/96 1121
ISB		960630H	1.12175		1.000		112.2	% REC	09/17/96 1320
MB		0916	-0.00041						09/17/96 1327
SB		960630G	1.03060		1.000		103.1	% REC	09/17/96 1342
CCV		960914Z	2.55118		2.5		102.0	% REC	09/17/96 1419
CCB		960729M	-0.00000						09/17/96 1424
MD	962419-7		0.66005			0.66671	1.0	RPD	09/17/96 1431
MS	962419-11	960630G	1.18595		1.000	0.19709	98.9	% REC	09/17/96 1439
CCV		960914Z	2.55746		2.5		102.3	% REC	09/17/96 1513



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A

Batch.....: 13334

Analyst....: gag

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.01

Parameter.....: Lithium (Li)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCB		960729M	-0.00543						09/17/96 1519
MD	962549-2		0.00445			0.00529	0.00084	ABS Diff.	09/17/96 1532
MD	962417-1		0.01807			0.01724	0.00083	ABS Diff.	09/17/96 1538
CCV		960914Z	2.67619		2.5		107.0	% REC	09/17/96 1607
CCB		960729M	0.00376						09/17/96 1611
ISB		960630H	1.13324		1.000		113.3	% REC	09/17/96 1629
CCV		960914Z	2.54616		2.5		101.8	% REC	09/17/96 1640
CCB		960729M	0.00250						09/17/96 1647

Test Method.....: SW-846 6010A

Batch.....: 13334

Analyst....: gag

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 5

Parameter.....: Potassium (K)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960412S	96.99591		100.0		97.0	% REC	09/17/96 1103
		960729M	0.36417						09/17/96 1121
		960630H	11.53703		10.000		115.4	% REC	09/17/96 1320
MD		0916	-0.36028						09/17/96 1327
SB		960630G	49.91285		50.000		99.8	% REC	09/17/96 1342
LCS		960912Y	96.14286		100.0		96.1	% REC	09/17/96 1344
LCS		960912Y	9.46128		10.000000		94.6	% REC	09/17/96 1350
CCV		9606208B	256.56900		250.00		102.6	% REC	09/17/96 1415
CCB		960729M	1.27585						09/17/96 1424
MD	962419-7		20.62985			20.13008	0.49977	ABS Diff.	09/17/96 1431
MS	962419-11	960630G	66.57006		50.000	17.78829	97.6	% REC	09/17/96 1439
CCV		9606208B	249.77706		250.00		99.9	% REC	09/17/96 1510
CCB		960729M	-0.04434						09/17/96 1519
MD	962549-2		21.49360			20.66886	0.82474	ABS Diff.	09/17/96 1532
MD	962417-1		10.04650			9.95820	0.08830	ABS Diff.	09/17/96 1538
CCV		9606208B	260.18933		250.00			% REC	09/17/96 1600
CCB		960729M	-0.22527						09/17/96 1611
ISB		960630H	9.54440		10.000		95.4	% REC	09/17/96 1629
CCV		9606208B	249.57984		250.00		99.8	% REC	09/17/96 1638
CCB		960729M	0.45231						09/17/96 1647

Test Method.....: SW-846 6010A

Batch.....: 13334

Analyst....: gag

Method Description.: Metals Analysis (ICAP)

Reporting Limit....: 0.01

Parameter.....: Scandium (Sc)

Units.....: mg/L

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960910M	1.90252		2.000		95.1	% REC	09/17/96 1045
ICB		960729M	0.00128						09/17/96 1121
ISB		960630H	1.11670		1.000		111.7	% REC	09/17/96 1320
MB		0916	0.00064						09/17/96 1327
SB		960630G	1.03719		1.000		103.7	% REC	09/17/96 1342
CCV		9606208B	2.49135		2.500		99.7	% REC	09/17/96 1415
CCB		960729M	0.00128						09/17/96 1424
	962419-7		0.00977			0.00976	0.00001	ABS Diff.	09/17/96 1431
	962419-11	960630G	0.98728		1.000	0.00352	98.4	% REC	09/17/96 1439



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Scandium (Sc)

Batch.....: 13334
Reporting Limit...: 0.01
Units.....: mg/L

Analyst...: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
CCV		960620BB	2.42319		2.500		96.9	% REC	09/17/96 1510
CCB		960729M	0.00064						09/17/96 1519
MD	962549-2		-0.00095			-0.00063	0.00032	ABS Diff.	09/17/96 1532
MD	962417-1		0.00096			0.00064	0.00032	ABS Diff.	09/17/96 1538
CCV		960620BB	2.53968		2.500			% REC	09/17/96 1600
CCB		960729M	0.00128						09/17/96 1611
ISB		960630H	1.13527		1.000		113.5	% REC	09/17/96 1629
CCV		960620BB	2.45647		2.500		98.3	% REC	09/17/96 1638
CCB		960729M	0.00128						09/17/96 1647

Test Method.....: SW-846 6010A
Method Description.: Metals Analysis (ICAP)
Parameter.....: Tin (Sn)

Batch.....: 13334
Reporting Limit...: 0.05
Units.....: mg/L

Analyst...: gag

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960412S	0.96388		1.00		96.4	% REC	09/17/96 1103
ICB		960729M	0.00848						09/17/96 1121
ISB		960630H	1.00198		1.000		100.2	% REC	09/17/96 1320
MB		0916	-0.01155						09/17/96 1327
SB		960630G	1.02403		1.000		102.4	% REC	09/17/96 1342
LCS		960912Y	0.97853		1.00		97.9	% REC	09/17/96 1344
LCS		960912Y	0.11796		0.100000		118.0	% REC	09/17/96 1350
CCV		960914Z	2.54316		2.5		101.7	% REC	09/17/96 1419
CCB		960729M	-0.01079						09/17/96 1424
MD	962419-7		-0.04077			-0.00977	0.03100	ABS Diff.	09/17/96 1431
MS	962419-11	960630G	0.74315		1.000	-0.00193	74.5	% REC	09/17/96 1439
PDS	962419-11	960630G	0.96838		1.000	-0.00193	97.0	% REC	09/17/96 1444
CCV		960914Z	2.48620		2.5		99.4	% REC	09/17/96 1513
CCB		960729M	-0.00617						09/17/96 1519
MD	962549-2		0.00717			0.01102	0.00385	ABS Diff.	09/17/96 1532
MD	962417-1		-0.00785			-0.00260	0.00525	ABS Diff.	09/17/96 1538
CCV		960914Z	2.63531		2.5		105.4	% REC	09/17/96 1607
CCB		960729M	-0.01311						09/17/96 1611
ISB		960630H	1.01733		1.000		101.7	% REC	09/17/96 1629
CCV		960914Z	2.59841		2.5		103.9	% REC	09/17/96 1640
CCB		960729M	-0.01003						09/17/96 1647

Test Method.....: SW-846 7041
Method Description.: Antimony (GFAA)
Parameter.....: Antimony (Sb)

Batch.....: 13341
Reporting Limit...: 0.002
Units.....: mg/L

Analyst...: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	Date/Time
ICV		960911B	0.03754		0.0400		93.8	% REC	09/17/96 1550
ICB		09176	-0.00072						09/17/96 1559
MB		0914	-0.00175						09/17/96 1602
LCS		960912Z	0.03969		0.040000		99.2	% REC	09/17/96 1606
MD	962419-3		0.00185			0.00179	0.00006	ABS Diff.	09/17/96 1613
MS	962419-4	960624L	0.01535		0.020000	0.00035	75.0	% REC	09/17/96 1621
MB		0906	0.00075						09/17/96 1633



CORE LABORATORIES

QUALITY CONTROL RESULTS

Job Number: 962419

Date: 09/25/96

CUSTOMER: Environmental Management Assoc.

PROJECT: CHEMGOLD IMPERIAL

ATTN: John Heggeness

Test Method.....: SW-846 7041

Method Description.: Antimony (GFAA)

Parameter.....: Antimony (Sb)

Batch.....: 13341

Detection Limit...: 0.002

Units.....: mg/L

Analyst....: lmt

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
LCS		960829H	0.03763		0.040000		94.1	% REC		09/17/96 1636
CCV		960911C	0.05130		0.050		102.6	% REC		09/17/96 1640
CCB		09176	0.00095							09/17/96 1644
MD	962428-1		-0.00160			-0.00010	0.00150	ABS Diff.		09/17/96 1652
MS	962428-2	960624L	0.01863		0.020000	0.00030	91.7	% REC		09/17/96 1700
SD	962428-2		-0.00107			0.00030		% Diff.		09/17/96 1703
CCV		960911C	0.05322		0.050		106.4	% REC		09/17/96 1707
CCB		09176	-0.00037							09/17/96 1711
MB		0917	-0.00119							09/17/96 1721
SB		960624L	0.01874		0.020000		93.7	% REC		09/17/96 1729
MD	962377-15		-0.00064			-0.00109	0.00045	ABS Diff.		09/17/96 1740
MS	962377-35	960624L	0.01812		0.020000	0.00094	85.9	% REC		09/17/96 1756
CCV		960911C	0.05052		0.050		101.0	% REC		09/17/96 1800
CCB		09176	-0.00077							09/17/96 1804
SD	962377-55		0.00056			0.00059		% Diff.		09/17/96 1816
CCV		960911C	0.05226		0.050		104.5	% REC		09/17/96 1820
CCB		09176	-0.00047							09/17/96 1824

Test Method.....: EPA 365.2

Method Description.: Phosphorous, All Forms

Parameter.....: Phosphorous, Total

Batch.....: 13553

Detection Limit...: 0.01

Units.....: mg/L

Analyst....: sgm

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	Units	F	Date/Time
MB			0.00							09/09/96 1500
LCS		G960219A	0.34		0.323000		105.3	% REC		09/09/96 1500
DSC		G960702A	0.20		0.200000		100.0	% REC		09/09/96 1500
ICV		G960219A	0.32		0.323000		99.1	% REC		09/09/96 1500
ICB			0.00							09/09/96 1500
EB			0.00							09/09/96 1500
CCV		G960702A	0.40		0.400000		100.0	% REC		09/09/96 1500
CCB			0.00							09/09/96 1500
EB			0.00							09/09/96 1500
ED	962377-22		0.36			0.46	24.4	RPD *		09/09/96 1500
MS	962377-22	G960702A	0.41		0.040000	0.36	125.0	% REC		09/09/96 1500
CCV		G960702A	0.41		0.400000		102.5	% REC		09/09/96 1500
CCB			0.00							09/09/96 1500
MD	962440-4		0.04			0.04	0.00	ABS Diff.		09/09/96 1500
MS	962440-4	G960702A	0.24		0.200000	0.04	100.0	% REC		09/09/96 1500
CCV		G960702A	0.40		0.400000		100.0	% REC		09/09/96 1500
CCB		G960702A	0.00		50.0					09/09/96 1500



CORE LABORATORIES

QUALITY ASSURANCE METHODS

REFERENCES AND NOTES

Report Date: 09/25/96

- (1) EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, March 1983
- (2) EPA SW-846, Test Methods for Evaluating Solid Waste, Third Edition, 1989
- (3) Standard Methods for The Examination of Water and Wastewater, 17th Edition, 1989
- (4) EPA 600/4-80-032, Prescribed Procedures For Measurement Of Radioactivity In Drinking Water, August 1980
- (5) EPA 600/8-78-017, Microbiological Methods For Monitoring The Environment, December 1978
- (6) Federal Register, July 1, 1990 (40 CFR Part 136)
- (7) EPA 600/4-88-03, Methods For The Determination of Organics Compounds in Drinking Water, December 1988
- (8) U.S.G.S. Methods For Determination of Inorganic Substances In Water And Fluvial Sediments, Book 5, Chapter A1, 1985
- (9) Federal Register, Friday, June 7, 1991 (40 CFR Parts 141 & 142)
- (10) Standard Methods For The Examination of Water and Wastewater, 16th Edition, 1985
- (11) ASTM, Section 11 Water and Environmental Technology, Volume 11.01 Water (1), 1991
- (12) Methods of Soil Analysis, American Society of Agronomy, Agronomy No. 9, 1965
- (13) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, Revision 1, November 1990
- (14) ASTM, Section 5, Petroleum Products, Lubricants, and Fossil Fuels, Volume 05.05, Gaseous Fuels, Coal, and Coke
- (15) EPA 600/2-78-054, Field and Laboratory Methods Applicable To Overburdens and Mine Soils, March 1978
- (16) ASTM, Part 19, Soils and Rocks; Building Stones, 1981

Comments: Data in the QA report may differ from final results due to digestion and/or dilution of sample into analytical ranges. The "Time Analyzed" in the QA report refers to the start time of the analytical batch which may not reflect the actual time of each analysis. The "Date Analyzed" is the actual date of analysis. Results for soil and sludge samples are reported on a wet weight basis (i.e. not corrected for percent moisture) unless otherwise indicated.

NC = Not Calculable Due to Value(s) lower than the Detection Limit.

BLANK QC SAMPLE IDENTIFICATION



CORE LABORATORIES

QUALITY ASSURANCE METHODS

REFERENCES AND NOTES

Report Date: 09/25/96

MB Method Blank
ICB Initial Calibration Blank
CCB Continuing Calibration Blank

SPIKE QC SAMPLE IDENTIFICATION

MS Method (Matrix) Spike
MSD Method (Matrix) Spike Duplicate
PDS Post Digestion Spike
SB Spiked Blank
SBD Spike Blank Duplicate

REFERENCE STANDARD QC SAMPLE IDENTIFICATION

LCS Laboratory Control Standard
RS Reference Standard
ICV Initial Calibration Verification Standard
CCV Continuing Calibration Verification Standard
ISA/ISB ICP Interface Check Sample
ICL Initial Calibration/Laboratory Control Sample
DSC Distilled Standard Check

DUPLICATE QC SAMPLE IDENTIFICATION

MD Method (Matrix) Duplicate
ED Extraction Duplicate
DD Digestion Duplicate

Analyses performed by a subcontract laboratory are indicated on the analytical and/or quality control reports under "technician" using the following codes:

SUBCONTRACT LABORATORY	CODE
Core Laboratories - Anaheim, CA	* AN
Core Laboratories - Casper, WY	* CA
Core Laboratories - Corpus Christi, TX	* CC
Core Laboratories - Houston, TX	* HP
Core Laboratories - Lake Charles, LA	* LC
Core Laboratories - Long Beach, CA	* LB
Other Subcontract Laboratories	* XX

EXPLANATION OF DATA FLAGS

- B - This flag is used to indicate that an analyte is present in the method blank as well as in the sample. It indicates that the client should consider this when evaluating the results.
- D - This flag indicates that surrogates were diluted out of calibration range and cannot be quantified.
- E - Indicates that a sample result is an estimate because the concentration exceeded the calibration range of the instrument.
- I - Used to indicate matrix interference.
- J - Indicates that a value is an estimate. It is used when a compound is determined to be present based on the mass spectral data, but at a concentration less than the practical quantitation limit of the method.



CORE LABORATORIES

QUALITY ASSURANCE METHODS

REFERENCES AND NOTES

Report Date: 09/25/96

- This flag is also used when estimating the concentration of a tentatively identified compound.
- X - Indicates that a surrogate recovery is outside the specified quality control limits.
 - Y - Used to identify a spike or spike duplicate recovery that is outside the specified quality control limits.
 - Z - Indicates a relative percent difference for a spike and spike duplicate is outside the specified quality control limits.
 - * - Indicates a relative percent difference for a duplicate analysis is outside the specified quality control limits.
 - - Used to indicate that a standard is outside specified quality control limits.

APPENDIX J-2

A SUPPLEMENTAL CULTURAL RESOURCES INVENTORY AND EVALUATION OF
THE POWER SUPPLY ROUTE FOR THE IMPERIAL PROJECT,
IMPERIAL COUNTY, CALIFORNIA

**A SUPPLEMENTAL CULTURAL RESOURCES
INVENTORY AND EVALUATION
OF THE POWER SUPPLY ROUTE FOR
THE IMPERIAL PROJECT,
IMPERIAL COUNTY, CALIFORNIA.**

**VOLUME I
TECHNICAL REPORT**

Prepared for:

*Chemgold, Inc.
P.O. Box 758
Winterhaven, California 92283*

Prepared by:

*ASM Affiliates, Inc.
543 Encinitas Blvd., Suite 114
Encinitas, California 92024
619-632-1094*

Jerry Schaefer, Ph.D.
Principal Investigator

Ken Victorino, M.A.
Associate Archaeologist
September 1996

USGS Quadrangle: Hedges, Calif. 1984, 7.5'
Acreage: 17 linear miles

Project Type: Intensive Pedestrian Survey

Key Words: Colorado Desert, Cargo Muchacho Mountains, Trails, Geoglyphs, Ceramic Scatters, Lithic Scatters, Historic Mining

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Volume II - Confidential Map and Site Records

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MANAGEMENT SUMMARY

A cultural resources inventory was undertaken of a portion of Indian Pass Road and the proposed 17 mile power supply route for the Chemgold's Imperial Mine project. This report is a supplement to the cultural resources inventory and evaluation undertaken for the proposed mine, providing data for compliance with the National Historic Preservation Act (36 CFR 800) (Schaefer and Schultze 1996). This study treats previously recorded and newly discovered archaeological sites along Indian Pass Road between Ogilby Road and the existing Imperial Irrigation District (IID) 34.5 kV transmission line, and along the existing IID line between Indian Pass Road and Interstate 8 along the west side of the Cargo Muchacho Mountains for 16 miles to the south. A records search and intensive pedestrian survey revealed 16 sites and two isolates along the route. Four of the previously recorded sites could not be relocated due to either subsequent disturbance or insufficient location data on site records. The site inventory includes four geoglyph sites with associated trails and artifact scatters, seven prehistoric and historic trail segments, one lithic scatter, one ceramic scatter, one historic mining sites, and two recent historic rock alignments. Two isolated chert flakes were also recorded. The four geoglyph sites, two of the trails, and the historic mining site are evaluated as significant and therefore potentially eligible for the National Register of Historic Places. One trail and one ceramic scatter that could not be relocated are evaluated as indeterminate. The remaining seven sites and two isolates are evaluated as not National Register eligible. The geoglyphs are also evaluated as significant for Native American Religious values and Native American consultation is recommended for further treatment of these sites. No direct impacts are projected at any of the sites except for five ceramic scatters at three sites (CA-IMP-3297H, -4131, and -7276). Data recovery is recommended for these ceramic scatters. Fencing and monitoring are recommended to avoid indirect impacts at the geoglyphs sites and some of the trails.

I. INTRODUCTION

This report presents the results of a supplemental cultural resource survey conducted by ASM Affiliates, Inc. as part of the Chemgold Imperial Project. Brian F. Mooney and Associates and ASM Affiliates, Inc. conducted an intensive pedestrian survey and cultural resource inventory of the 2,212 acre Chemgold Imperial Mine Project in 1991 and 1995. The results are documented in *Cultural Resources of Indian Pass: An Inventory and Evaluation for the Imperial Project, Imperial County, California*, prepared by ASM Affiliates, Inc. (Schaefer and Schultze 1996). The reader is referred to that report for a complete discussion of previous research in the area, environmental and cultural setting, and the criteria for making significance evaluations.

PROJECT DESCRIPTION

To deliver power to the Imperial Project, an existing Imperial Irrigation District (IID) 34.5 kV transmission line, built in 1964, would be "overbuilt" with a new 92 kV transmission line to also be owned by IID. The surveyed area also includes a one mile stretch of Indian Pass Road near Ogilby Road east to the exiting IID line that would be realigned approximately 330 feet to the south so the two roads could intersect at more of a right angle rather than the present acute angle. The surveyed transmission line route begins at Indian Pass Road and proceeds approximately 16 miles south skirting the west side of the Cargo Muchacho Mountains to Sidewinder Road and Interstate 8 (Figure 1). This new 92 kV/34.5 kV transmission line would be connected to the existing IID 92 kV "C-line" at a location immediately south of Interstate 8. At the point where the existing 34.5 kV transmission line crosses Indian Pass Road (approximately 4.5 miles southwest of the Project mine and process area), a new electrical metering station would be constructed and owned by the Project. From the metering station, a new 92 kV transmission lines, also owned by the Project, would be built adjacent to the south side of Indian Pass Road to a mine substation located within the Project mine and process area. A 7.2 kV distribution line would be "overbuilt" on the same poles as the new 92 kV transmission line running adjacent to Indian Pass Road to provide power as necessary to the ground water well pumps located adjacent to Indian Pass Road in the Project ancillary area.

The metering station would be built within a fenced area approximately 25 feet by 50 feet located southeast of the intersection of the existing 34.5 kV transmission line and Indian Pass Road. The mine substation would be enclosed within the similarly sized fenced area among the Project facilities located near the northwest corner of the heap leach pad.

The process of "overbuilding" the exiting 34.5 kV transmission line entails: (1) tilting the existing wooden poles to the side to move the electrical conductors out of the current transmission line alignment; (2) installing new, taller, wooden poles in the same transmission line alignment; (3) installing the new 92 kV conductors near the top of the poles; (4) moving the existing 34.5 kV conductors from the existing poles to below the 92 kV conductors on the new poles; and (5) removing the existing poles.

The 92 kV/34.5 kV transmission line would be constructed within the 20-foot wide right-of-way granted by the BLM and the easements obtained from the private landowners near Interstate 8 for the existing transmission line. Construction access would be from the existing transmission line access road, which roughly parallels the entire length of the transmission line. To tilt and remove the existing

poles, the short trails from the access road to each existing pole and the areas around each existing pole which were disturbed when the transmission line was originally installed in 1964 will be redisturbed.

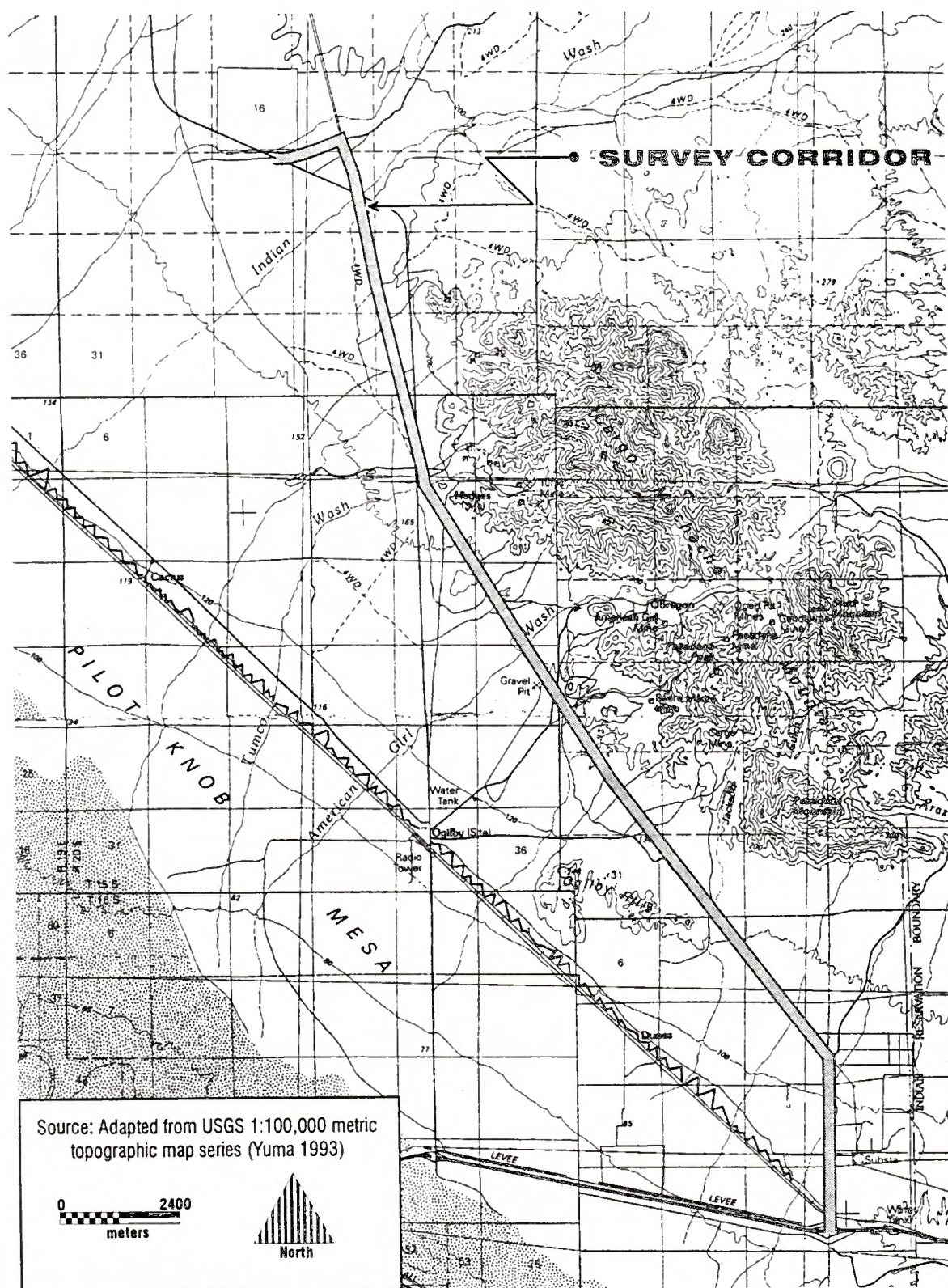


Figure 1. Project location map

However, spacing of the approximately 280 new poles may be reduced to approximately 300 feet from the existing spacing of 400 feet, which would require the disturbance of short trails from the existing access road to each new pole, as well as disturbance of the area around each new pole. Additional surface disturbance within a 100-foot square area will also occur when the existing and new conductors are "pulled" from approximately nine cable pulling stations, and from equipment laydown areas to be established at each end of the transmission line. It is estimated that approximately 21 acres will be disturbed during construction.

RECORD SEARCH AND FIELD METHODS

Under the direction of Jerry Schaefer, Ph.D., (Principal Investigator) the supplemental cultural resource survey was conducted over a three day period, September 4-6, 1996, by Ken Victorino (field supervisor), Stephanie Barker, Barb Giacomini, Shannon Hamilton. A record search covering an area one-half mile beyond the project boundary was first conducted at the Southeast Information Center (located in the Imperial Valley College Desert Museum, Ocotillo) on September 3, 1996, prior to the survey.

Information for new sites and isolates, including type, description, location, disturbance/integrity, and topography, was documented. Site/isolate location was plotted on a 7.5 minute USGS quadrangle map, a map of the site showing topography and any distinguishing features (such as transmission line poles) was sketched, and photographs of the site and surrounding area were taken. No artifacts were collected. Previously recorded sites within the survey area were relocated, if possible, and evaluated for accuracy of site forms and changes since the last investigations.

Previously recorded sites within the project right-of-way are included in Volume II of this report, along with new site forms for newly discovered sites and supplements to existing site forms when new information was collected for previously recorded sites. The site records for the one-half mile areas on either side of the survey corridor are on file at ASM Affiliates.

A pre-existing transmission line corridor about 100 feet wide and 16 miles long, beginning at the intersection of the Imperial Irrigation District (IID) 34.5 kV transmission line with Indian Pass Road and ending at its interconnection with the IID "A" line immediately south of Interstate 8 was examined during the supplemental survey (Figure 1). This strip was surveyed using 15 foot intervals between surveyors and covered an area 50 feet on either side of the transmission line centerline. An additional 650 foot wide strip along Indian Pass Road (150 feet north of the road and 500 feet south) was surveyed from its intersection with Ogilby Road to the point Indian Pass Road runs under the IID 34.5 kV transmission line. This section, approximately one mile in length, was surveyed at 75 foot intervals.

Access road and transmission line construction, along with off-road vehicles contributed to the high level of disturbance within the survey area. Visibility was good throughout the entire area. The remaining transmission line corridor along Indian Pass Road between the exiting IID transmission line and the Project mine and processing area was surveyed as part of the previous inventory with regard to improvements to Indian Pass Road (Schaefer and Schultze 1996).

II. RESULTS

The record search at the Southeast Information Center revealed that the study area had been the subject of a previous study. In 1994, Western Cultural Resource Management (Farmington, New Mexico) conducted the Western Area Power Administration Blythe-Knob 161 kV Transmission Line Class III Cultural Resource Inventory. This investigation surveyed the 161 kV twin-pole "H"-frame transmission line which parallels and is just east of the 34.5 kV single pole transmission line for most of its length. Several of the sites found within the present survey area were recorded at this time.

During the current study, 11 of the 15 sites previously recorded within the survey area were relocated and evaluated for the accuracy and adequacy of the existing site record. They are summarized in Table 1 and the detailed site records for each appear in the confidential Volume II, along with the map showing their locations along the transmission line route (Volume II, Figure 1). The 1994 site records were found to be extremely good although earlier records tended to have inadequate location information. Two sites, IMP-6661 and -3297/H, were updated when additional artifact scatters were discovered. The previous site boundary of IMP-6661 was extended approximately 40 m east to include two new lithic scatters with a total of 41 predominantly interior, chert flakes. IMP-3297/H, a trail with three pieces of associated pottery, continued to the south beyond the previous recording and included five additional ceramic scatters with 60+ sherds. The remaining four sites were not relocated probably due to erosion, access road widening, collection, or imprecise mapping.

Two new sites and one isolate were recorded (see Table 1). The first site, temporarily designated site 96-2, is a rock ring located south of Indian Pass Road and west of the IID 34.5 kV transmission line. Approximately 20 lightly embedded, granite and metavolcanic rocks compose the ring. The rocks in the south half are light colored while the rocks in the north half are dark colored, giving the ring the appearance of a geoglyph or marker, but of recent historic date. In the center of the 3m diameter ring is a pile of about five rocks. Charcoal and aluminum foil scraps were found loosely imbedded inside the rock ring. Several modern fire rings are in the adjacent area. Site 96-3 is a j-shaped configuration of rock approximately 5m long and 2.5m wide. The arrangement, approximately 25m west of Sidewinder Road, includes about 50 granite and metavolcanic rocks of varying size. A small pile of dark river pebbles from the surrounding desert pavement is in the hook section of the "J." Pieces of broken brown and green glass along with rusted bottle tops are nearby indicating recent historic origins. Finally, 96-11 is an isolated chert flake. Approximately 25m west of Sidewinder Road, the mustard-colored flake is lightly embedded in a flat desert pavement of small river pebbles.

Table 1. Previously Recorded Sites Within Survey Area

Site Designation	Site Type/Description	Artifacts	Relocated (yes/no)	Comments	Significance
IMP-666I	Two geoglyphs, rock alignment, cleared circle, "shaman's hearth," and associated lithics	One utilized red jasper flake and one red chert biface scraper	yes	Site update. Two newly recorded lithic scatters, totaling 40+ flakes, extend previous site boundary. The anthropomorphic geoglyph is questionable. Site will be impacted during transmission line reconstruction.	Y
96-2	Rock ring -- composed of approx. 20 granite and metavolcanic rocks. Five rocks are piled in the center of the 3m diameter ring.	None		Aluminum foil scraps found loosely embedded inside rock ring. Several modern fire rings in adjacent area.	N
IMP-4131	Geoglyph, two cleared circles, one quartz flaking station, and a ceramic concentration	Approximately 75 - 100 body sherds and one rim. One core fragment and seven flakes.	yes	Cleared circles (which are vague) and geoglyph	Y
IMP-1469T	Trail	None	no	Site record lacking. No site map and poor site description.	I
IMP-7272T	Trail	None	yes	"Site has been heavily impacted...lack of artifacts suggests that little information can be acquired" according to 1994 record.	N
IMP-7273T/H	Three trail segments and an historic component	No prehistoric artifacts.	yes	Historic component will not be impacted. According to 1994 site record "further investigation is need to determine if apparent tent clearings may be related to mining activity."	N
IMP-3297/H	Ceramic scatter with associated trail	Two body sherds and one rim sherd (Tumco buff)	yes	Site update. Five new ceramic scatters (60+ sherds) were recorded along the identified trail, which continues to the south. Only two scatters, containing less than 10 sherds will be impacted during transmission line reconstruction.	Y
IMP-7274T	Trail	None	yes	According to 1994 recording "site retains the potential to provide information...even though the trail is heavily impacted."	Y
IMP-1471T	Trail	None	no	Site record lacking. No site map and poor site description.	I
IMP-7275T	Trail	None	yes	"Trail is heavily impacted and retains little potential to provide new information" according to 1994 site record.	N
IMP-7191 I	One brown chert flake, unifacially retouched into a scraper		yes	Will be impacted.	N
IMP-7339	Ceramic scatter	45 sherds (Palomas Red-on-buff)	no	Possible access road widening (site was recorded as being 1.5m away from road in 1994) and erosion due to seasonal drainage west of the site may be responsible for difficulty in relocation. "Can provide little new information" according to 1994 site record.	I

Site Designation	Site Type/Description	Artifacts	Relocated (yes/no)	Comments	Significance
IMP-7276T	Trail segment, possible geoglyph, and pot drop	40 bowl sherds, two of which are rim fragments	yes	Impact possible during reconstruction. According to 1994 record "site can provide additional information concerning a wide variety of research questions."	Y
IMP-7269/H	Historic dump, possible hearth, trail segment, and possible geoglyph	Hole-in-cap cans with soldered side seams and hand-finished bottle fragments	yes	Geoglyph is questionable. Only a small portion of the site will be impacted by transmission line reconstruction. A BLM archaeologist, who visited the site, suggested that "the possible geoglyph was caused by dragging a heavy object and that the historic materials lacked integrity" according to the 1994 site record.	Y
IMP-2878	Geoglyph with ceramic concentrations and lithic scatter	Three distinct pot drops containing a total of 111 body sherds	yes	According to site record, Boma Johnson (Arizona BLM archaeologist) suggested that "the geoglyph may represent a ceremonial pathway or procession way." Geoglyph should not be impacted during reconstruction.	Y
96-11	Isolated chert flake				N
96-3	Rock arrangement -- 50 granite and metavolcanic rocks in the shape of a "j," about 5m long and 2.5m wide. Small pile of dark river pebbles (from surrounding desert pavement) in the hook section of the "j."	None		Broken brown and green glass along with rusted bottle tops nearby.	N
IMP-7340	Lithic scatter	7 pieces of angular chert debris	no	1994 site description and site map places lithic scatter in transmission line access road. "Only minimal information can be gained" according to record.	N

III. SIGNIFICANCE EVALUATION, IMPACT PROJECTIONS, AND MITIGATION RECOMMENDATIONS

The following evaluation treats each of the sites recorded within the transmission line, area of potential effect (APE). Evaluations are also summarized in Table 1. Sites are discussed above in Table 1 in the order that they occur, starting at the north end of the transmission line route at Indian Pass Road and proceeding south to Interstate 8. Significance criteria for assessing National Register eligibility are discussed in detail in the Imperial Mine Inventory report to which this is a supplement (Schaefer and Schultze 1996).

Seven sites are evaluated as significant and therefore potentially eligible for the National Register based on criterion "D." These include CA-IMP-6661, -4131, -3297/H, -7274T, -7276, -7269/H, and -2878. In addition, four or five of these sites (CA-IMP-6661, -4131, -7276, possibly 7269/H, and -2878) contain geoglyphs or possible geoglyphs with potential Native American religious values. In every case, the geoglyphs are in portions of the sites outside the transmission line APE or can be avoided through fencing and monitoring procedures. At three sites (CA-IMP-3297/H, -4131, and -7276), recovery of five ceramic scatters is recommended because of their proximity to the access road or location within the APE. Native American consultation is recommended to supplement this significance evaluation and to develop appropriate mitigation measures.

Seven sites are evaluated as not significant or National Register eligible. They are either too recent in date (CA-IMP-7273/H, 96-2, 96-3), too disturbed (CA-IMP-7272T, 7275T), or are very small lithic scatters with little research potential (CA-IMP-7340). Two recorded isolates are de facto not significant. Three previously recorded sites could not be relocated and are evaluated as indeterminate.

IMP-6661

This complex of two geoglyphs with associated isolated artifacts, rock alignment, cleared circle, and hearth feature are significant under criterion "D" and also for Native American religious values. The original recorder called a small rock ring a "shaman's hearth" but this is a subjective interpretation. It is associated with the geoglyphs, however, and is a significant element of the complex. The anthropomorphic geoglyph is impacted by vehicle tracks but otherwise the complex is in good condition. Located only 36 m north of Indian Pass Road and very close to the intersection with Ogilby Road, the geoglyph complex is possibly subject to potential indirect impacts associated with the realignment of the Indian Pass Road-Ogilby Road intersection approximately 330 feet to the south (away from IMP-6661). It is recommended that Native American consultation first be undertaken regarding protection of this site. It is also recommended that temporary fencing be placed around the geoglyph complex prior to construction to prevent indirect impacts. The fencing should be placed far enough away from the geoglyphs to avoid impacts and be of a type that does not disturb the desert pavement. The fencing should then be removed following construction.

SITE 96-2

This newly recorded rock ring is composed of widely spaced cobbles and boulders on late Holocene gravel pavement. There are five light gray granitic cobbles piles in the center. An unusual aspect of the rock ring is that the southern half of the rock ring is composed entirely of light gray granitic boulders while the northern half is composed of varnished dark brown boulders. All of the rocks are either directly above or lightly embedded in the desert pavement. Aluminum foil scraps found embedded in the rock ring and its location at the juncture of Indian Pass road and the transmission line suggest this is a recent historic or modern feature, possibly a landmark. This site is evaluated as not significant because of its apparent recent age.

IMP-4131

This complex of a geoglyph, cleared circles, a pottery scatter, and a few isolated flakes and sherd is located within the transmission line APE and just west of the bladed access road. It is evaluated as significant under criterion "D" and also for Native American religious values. The Palomas Buff sherds, if associated with the other features, tentatively date the site to the Patayan II phase (A.D. 1000-1700) or Patayan III phase (A.D. 1700-1940). The site has already experienced extensive impacts from the access road and some heavy machinery use but the ceramics and geoglyph persist. Direct impacts to the sherd scatter are possible and there is the potential for indirect impacts to the cleared circles and the geoglyph. First Native American consultation should be undertaken regarding the significance evaluation and protecting the site. The sherds in the APE should be collected and analyzed with regard to confirming the ceramic type and reconstructing the shape to better establish the date and cultural association. The Quechan Cultural Center is the recommended curation facility for the sherds. Temporary fencing should be placed around the geoglyph complex prior to construction to prevent indirect impacts. This should be placed far enough away from the geoglyphs to avoid impacts and be of a type that does not disturb the desert pavement. The fencing should then be removed following construction.

IMP-1469T

This 60 m long northwest-southeast trending trail segment was reported in 1977 in association with the transmission line road but without a location map or other documentation. The orientation of the trail leading into the Cargo Muchacho Mountains suggests that it is associated with historic mining activities but it may also be prehistoric and was connected with the important trail, IMP-5359T, that leads to Indian Pass or with activities in the Cargo Muchacho Mountains. No trace of the trail was found in the project area and it is likely that it was destroyed subsequent to the transmission line construction. The site is therefore evaluated as indeterminate unless it is relocated in the future.

IMP-7272T

This 110 m long, east-west trending trail segment is bisected by the transmission line corridor, access road, Ogilby Road, and several erosional features. The orientation suggests it led up one of the major washes into the Cargo Muchacho Mountains. Although Patayan ceramics were found in association when first recorded in 1977, no artifacts remain and only a few portions of the trail remain preserved. The site is therefore evaluated as not significant.

IMP-7273/H

This site includes three tent clearings with hearth and historic rock alignments that form the initials "R.A." that are probably not related with the historic mining town of Hedges/Tumco. The apparent recent date and lack of historic artifacts indicate the site is therefore not significant. The initials may date to the mine but the clearings appear to be of more recent date. All of these are located at least 75 m east of the APE. Three trails occur nearby, two of which are bisected by the transmission line and one of which runs parallel some 20-40 m east of the APE. The trails do not appear to be associated with historic mining activities but may be outliers. The complex is not physically connected to the larger Hedges/Tumco site (IMP-3279H) and probably post-dates it.

IMP-3297/H

This trail with associated Patayan ceramic scatters is oriented in a northeast-southwest direction, leading into the Cargo Muchacho Mountains and the mining site of Hedges/Tumco. Because of the large number of ceramics and associations with Hedges/Tumco, the site is evaluated as significant under criterion "D." A small ceramic scatter was previously recorded outside the transmission line APE to the north and five additional scatters containing more than 60 sherds were recorded in areas just north of the transmission line and in extensions of the trail south of the project APE. The trail may be a prehistoric Patayan trail system leading into the Cargo Muchacho Mountains. Some of the major washes in the Cargo Muchacho Mountains may have supported some desert riparian habitats with plant and animal resources of interest to Native Americans. However, the Cargo Muchacho Mountains appear to have been marginal compared to other areas. It is also possible that the ceramics date to the late 19th or early 20th century during the time of historic mining at Hedges/Tumco. Analysis of traditional Patayan ceramics from the historic mining site demonstrate that Quechan ceramics were being sold or traded to miners for water storage and cooking vessels. The Quechan were also modifying some of their vessel forms to imitate late Victorian era cups, saucers, and pitchers (Schaefer 1993). The date of these ceramics would have to be determined by examining temper characteristics, rim form, and shape to see if they typify this historic Quechan ceramic tradition. If the ceramics were found to be contemporary with Hedges/Tumco, these finds may suggest that Quechan were traveling directly to the mining camps to trade their ceramics rather than conducting business in Yuma or through middlemen merchants. Some of the pottery may also have been dropped by Mexican or Anglo miners. In either case, the trails and ceramics have the potential to address questions of economic and cultural influences between Quechan and Euro-American peoples at the turn of the century.

Two of the ceramic scatters and a newly recorded segment of trail are likely to be impacted by transmission line construction. Data recovery is recommended for these scatters. No additional impacts are projected for ceramic scatters outside the APE although measures should be taken to ensure that no indirect impacts occur in this location and that any proposed staging areas avoid this location.

IMP-7274T

This northeast-southwest trending trail segment connects with the main historic access road to Hedges/Tumco. It was previously interpreted as a secondary access route to the mining community. It is evaluated as significant under criterion "D" because it provides additional information on the transportation and communication network associated with the National Register eligible site of Hedges/Tumco (IMP-3297H). The transmission line APE bisects the trail and it has already been severely impacted by an existing graded area under the transmission line. No additional impacts are projected.

IMP-1471T

This northeast-southwest trail segment was originally recorded in 1977 but with no location map or additional information. Due to the lack of evidence, the trail assigned this number and given this location is evaluated as indeterminate. It could not be relocated during the present survey and may either no longer exist due to erosion, or due to the quality of maps available at that time, may actually be mismapped. It is possible that it is actually one of the other trails recorded just to the north or south. Site records for the next trail south suggest that this early site record may actually refer to site IMP-7275.

IMP-7275

This northeast-southwest oriented trail has no associated artifacts and was previously recorded as a prehistoric trail segment. It is evaluated as not significant because of the poor preservation and lack of associated artifacts. It leads into American Girl Wash and may have provided access to the riparian resources in this area of the Cargo Muchacho Mountains. Alternatively or in addition, it may also have been an historic trail leading to the American Girl Mine that was active at the turn of the century (Hector et al. 1991). That portion of the trail within the project APE is substantially impacted by heavy equipment disturbance. No additional impacts are projected from the current project.

IMP-7191-I

A single isolated brown chert flake with evidence of unifacial retouch lies directly in the transmission line APE. Most isolates such as this are *de facto* not significant or National Register eligible. Although the lithic may be directly impacted, not further investigations are recommended.

IMP-7339

This pot drop consisting of two scatters of Palomas Red-on-Buff ceramic was recorded in 1994 just west of the transmission line access road. Because the ceramic scatter could not be relocated, it is evaluated as indeterminate. It may have been either recovered or displaced during access road widening or displaced by erosion. We disagree with the original assessment that it is not significant. Decorated Patayan ceramics are extremely rare and this reconstructed vessel could provide information on Patayan chronology and ceramic traditions, making it potentially significant under criterion "D." Decoration became more common in the ethnohistoric period and this vessel may have been manufactured for Mexicans or Euro-americans as well.

IMP-7276

A site composed of a trail segment, geoglyph, and ceramic scatter are located just west of the transmission line right-of-way. The site is evaluated as significant under criterion "D" and also for possible Native American values. The geoglyph is a 4-meter diameter circle tamped into the desert pavement. It is interpreted as a possible dance circle but this is a preliminary interpretation subject to further investigation because of its small size. Native American consultation is advised in this matter. It is located 40 m west of the transmission line centerline. The pot drop of 40 sherds is located only 2 m west of the access road. These consist of Palomas Red-on-buff sherds. The site is located in an area of substantial previous disturbance from off-road activity and erosion. Prior to Native American consultation on the matter, some mitigation recommendations can be made. Indirect impacts to the geoglyphs can be avoided by erecting temporary fencing and/or signs to direct construction vehicles to stay on approved access roads. The pot drop is located so close to the road that data recovery and analysis are recommended. The trail has already been directly impacted by erosion and heavy equipment within the project APE. No additional impacts are projected.

IMP-7269/H

This site includes four historic trash dumps, hearth, and historic artifact scatter associated with the turn of the century mining activity that was so prevalent in the Cargo Muchacho Mountains. The two ceramic sherds may also be historic or from historic Quechan ceramics sold to miners. Underlying this heavily disturbed area are wheat previous recorded suggest is a possible geoglyph. This area is so disturbed that it is difficult to access this feature and it may likely have resulted from historic activities.

A small segment of what may have been a prehistoric trail also occurs at the north end of the site. The historic trash dumps and artifact scatter contain enough information to contribute to our understanding of historic mining lifeways and foodways. They are therefore evaluated as significant under criterion "D." The possible prehistoric elements appear to be so impacted as to have limited significant under criterion "D." Native American consultation should be undertaken to access possible religious values. In either case, the site lies outside the transmission line corridor although access roads are located immediately to the west of the complex. No direct impacts are therefore projected. Indirect impacts can be avoided through signing and temporary markers or fencing to prevent inadvertent off-road activity.

IMP-2878

This site is a geoglyph complex with associated quartz chipping stations and scatters, and three ceramic scatters. It is evaluated as significant under criterion "D" and also for Native American religious values. The geoglyph and one of the sherd scatters is located to the north of the transmission line right-of-way and a secondary bladed road that is not part of the original transmission line access road. The second pot drop is located just north of the 161 kV H-pole transmission line centerline. The third ceramic scatter, isolated sherds, and the quartz scatter are located to the south of the transmission line access road. Direct impacts can be avoided to all of these features but this will require some careful project planning and impact avoidance measures. Indirect impacts, can be prevented through careful placement of protective fencing and markers during construction. Monitoring may also be advisable to prevent inadvertent off-road disturbance given the proximity to existing graded roads. Native American consultation is advised in developing impact mitigation measures at this site.

SITE 96-I1

This isolated chert flake is de facto not significant.

SITE 96-3

This arrangement of 50 granite and metavolcanic rocks with associated recent historic artifacts is a modern or recent "geoglyph." It is not significant because of its recent age and lack of association with important cultural patterns. No additional treatment is recommended.

IMP-7340

This site is composed of seven pieces of chert debitage located just south of the disturbed 161 kV H-pole transmission line right-of-way. The limited variability of materials and lack of diagnostics lead to the conclusion that this site is not significant. No additional treatment is recommended.

IV. REFERENCES

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